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ANNUAL REPORT OF THE

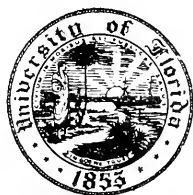
Governor of The

Panama Canal

FOR THE FISCAL YEAR 1951

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ANNUAL REPORT
OF THE
GOVERNOR
OF
THE PANAMA CANAL
FOR THE
FISCAL YEAR 1951



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LETTER OF TRANSMITTAL

BALBOA HEIGHTS, C. Z. DECEMBER 28, 1951.

The Honorable, THE SECRETARY OF THE ARMY,

Washington, D. C.

MY DEAR MR. SECRETARY: I have the honor to submit the report of the Governor of the Panama Canal for the fiscal year ended June 30, 1951.

This annual report is the final report submitted for the Panama Canal.

Effective July 1, 1951, the governmental functions previously performed by the Panama Canal were transferred to a new agency designated as the Canal Zone Government. All activities other than of a strictly governmental nature were transferred to the new Panama Canal Company, which also absorbed the Panama Railroad Company.

Very respectfully,

F. K. NEWCOMER, *Governor.*

OFFICIALS OF THE PANAMA CANAL AND PANAMA RAILROAD COMPANY

The following is a list of the major officials of the Panama Canal and the Panama Railroad Company as of June 30, 1951:

The Panama Canal

Brig. Gen. F. K. Newcomer, U. S. A. (retired), Governor.
Col. Herbert D. Vogel, U. S. A., Lieutenant Governor.
Capt. Robert M. Peachey, U. S. N., Marine Director.
E. C. Lombard, Executive Secretary.
Maj. Gen. George W. Rice, U. S. A., Health Director.
Col. G. K. Withers, U. S. A., Engineering and Construction Director.
Capt. John J. Scheibeler, U. S. N., Industrial Director.
L. B. Moore, Supply and Service Director.
Arnold Bruckner, Finance Director.
Col. Richardson Selee, U. S. A. (retired), Civil Affairs Director.
H. L. Donovan, Community Services Director.
E. N. Stokes, Railroad and Terminals Director.
E. A. Doolan, Personnel Director.
P. A. Bentz, General Counsel.
B. F. Burdick, Chief of Washington Office and General Purchasing Officer.

Panama Railroad Company

Brig. Gen. F. K. Newcomer, U. S. A. (retired), President.
Col. Herbert D. Vogel, U. S. A., Second Vice President.
E. N. Stokes, Railroad and Terminals Director.

(NEW YORK OFFICE)

W. R. Pfizer, Vice President.
J. C. Hughes, Secretary.
W. L. Hall, Treasurer

REPORTS OF BUREAU DIRECTORS AND DIVISIONS

Appendixes Not Printed

The material in the annual report of the Governor of the Panama Canal, published in this volume, is to a large extent a summary of the data presented in the annual reports from the bureau directors and divisions of the Canal organization; the latter, regarded as appendixes to the report of the Governor, are not printed. The annual report of the Panama Railroad is published separately. The reports of the bureau directors and divisions as listed below are on file at the Washington Office of the Panama Canal, and at the office of the Governor at Balboa Heights, C. Z.:

Staff:

- Law Division.
- Management Division.
- Safety Branch.
- Pardon Board.
- Public Defender.

Administration:

- Personnel Bureau.
- Finance Bureau.
- Administrative Branch:
 - Surveying Officer.
- Magistrates' Courts:
 - Magistrate, Balboa.
 - Magistrate, Cristobal.

Operations:

- Civil Affairs Bureau:
 - Schools Division.
 - Police Division.
 - Postal, Customs, and Immigration Division.
 - Fire Division.

- Health Bureau.

Marine Bureau:

- Locks Division.
- Dredging Division.
- Navigation Division.
- Aids to Navigation Section.

Engineering and Construction Bureau.

- Engineering Division.
- Electrical Division.
- Municipal Division.
- Building Division.
- Meteorological and Hydrographic Branch.

- Supply and Service Bureau.

- Industrial Bureau.

- Community Services Bureau.

- Clubhouse Division.
- Housing Division.
- Grounds Maintenance Division.

- Washington Office.

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ANNUAL REPORT OF THE GOVERNOR OF THE PANAMA CANAL

INTRODUCTION

The Panama Canal

The Panama Canal is a lock-type canal that connects the Atlantic and the Pacific Oceans through the Isthmus of Panama, traversing a distance of approximately 51 miles from deep water to deep water. In the dredged channel, the Canal has a minimum width of 300 feet and a minimum depth of 42 feet. The greatest part of the Canal channel is at the level of Gatun Lake, the surface of which is 85 feet above sea level. In transiting the Canal a ship is raised in three steps or lockages to the level of Gatun Lake and subsequently lowered in three steps to sea level at the other side of the Isthmus. Each of the twin chambers in each flight of locks has a usable length of 1,000 feet and width of 110 feet, and is about 70 feet deep. The flights are in duplicate, enabling ships to be passed in opposite directions simultaneously.

Canal Zone

Generally speaking, the Canal Zone comprises a strip of land extending 5 miles on either side of the center line of the Canal channel and three marine miles beyond low-water mark in the Atlantic and Pacific Oceans. The Canal Zone includes also such areas outside of the 5-mile limits as are covered by the waters of Gatun and Madden Lakes and the lands immediately adjacent to these lakes which are below the 100-foot and 260-foot contour lines, respectively, referred to mean sea level. The use, occupation, and control of the Canal Zone have been granted to the United States Government by the Republic of Panama, under treaty agreements, for the construction, maintenance, operation, sanitation, and protection of the Canal enterprise, and the Republic has further granted to the United States all rights, power, and authority within the Canal Zone which the United States would possess and exercise if it were sovereign of the territory.

Organization

The Panama Canal is an independent agency in the executive branch of the Government, directly under the President, but by delegation of responsibility the Secretary of the Army represents the President in

the supervision of Canal affairs. Administration and executive authority are vested in a Governor. The Governor is also president of the Panama Railroad Company, a Government-owned corporation that functions as an adjunct of the Canal enterprise.

On January 1, 1950, the President of the United States issued Executive Order No. 10101 (amending Executive Order No. 9746 of July 1, 1946) which delegated to the Governor of the Panama Canal authority to determine the internal organization of the Panama Canal. By virtue of such authority, so far as concerns the organization known as the Panama Canal for the care, maintenance, sanitation, operation, and protection of the Panama Canal and the Government of the Canal Zone, and with the approval of the Board of Directors of the Panama Railroad Company so far as concerns the organization of that Corporation, the Governor, under date of March 13, 1950, directed that the organization of the Panama Canal-Panama Railroad Company be revised effective July 1, 1950, and set forth in coordinated outline the functions and responsibilities of the principal units of the two organizations.

The revised organization consists of the following:

(a) Office of the Governor-President, which includes the Lieutenant Governor of the Panama Canal, who is also Second Vice President of the Panama Railroad Company; an Executive Secretary of the Panama Canal; an Executive Assistant to the Governor-President; and a Military Assistant to the Governor.

(b) Five staff units, namely, a Management Division, a Law Division, a Civil Intelligence Branch, a Safety Branch, and Special Assistants and Boards.

(c) Four administrative units, as follows: Finance Bureau, Personnel Bureau, Administrative Branch, and Magistrates Courts.

(d) Eight operations units designated Marine Bureau, Engineering and Construction Bureau, Health Bureau, Supply and Service Bureau, Civil Affairs Bureau, Industrial Bureau, Community Services Bureau, and Railroad and Terminals Bureau.

(e) Two offices in the United States: The Washington Office of the Panama Canal and the New York Office of the Panama Railroad Company.

Operation and Maintenance of the Canal

The primary function of the Panama Canal is to provide and maintain a waterway by means of which vessels may make the transit from one ocean to the other, and to handle such traffic as presents itself for transit with a maximum of safety and a minimum of delay. Essentially this involves the maintenance of the waterway, the operation of the locks, and the control of traffic through the Canal. Through-

out the year the Canal force maintained its high standard for expeditious service not only in the actual transiting of ships but in providing emergency repairs, fuel, supplies, and the various supplementary services incidental to shipping. There were no major interruptions of ship traffic during the year.

Operation of Auxiliary Enterprises—Business Operations

Second only to the operation of the Canal is the function of supplying necessary services to shipping and the Canal operating force. These services are provided under coordinated and centralized control by the various business units of the Panama Canal and Panama Railroad Company and include oil and coal bunkering plants; storehouses for food, ship chandlery, and other essential supplies; marine repair shops; harbor terminal facilities for passengers and for handling and transshipping cargo; a railroad line across the Isthmus; a steamship line between New York and the Canal Zone; water and electric power systems; and living quarters and retail commissary stores for the operating force.

Government—Administration

The usual functions of government, such as schools, police and fire protection, quarantine, public health, immigration service, posts, customs, and similar activities, which, in the United States are directed by various officers of the National, State, and municipal governments, are entrusted in the Canal Zone to the Governor, and are executed under his authority and responsibility. This centralization of all governmental activities under one head is essential to economical and efficient administration.

Reorganization

Effective July 1, 1951, by the terms of Executive Order No. 10263 issued June 29, 1951, the organization described above was succeeded by a new organization which is more fully discussed in section III of this report.

Briefly, the Panama Railroad Company was renamed the Panama Canal Company and all activities other than of a strictly governmental nature were transferred to the new company from the Panama Canal. The governmental functions previously performed by the Panama Canal were transferred to a new agency designated as the Canal Zone Government. On the effective date of the new organization, the Panama Canal and the Panama Railroad Company ceased to exist under those names.

This annual report is the final report submitted for the Panama Canal.

Other Organizations in Canal Zone

In addition to the Canal-Railroad organization, a coordinated organization is maintained in the Canal Zone by the United States Army, the United States Navy, and the United States Air Force, under the over-all command of the Commander in Chief, Caribbean. The United States Department of Justice also maintains a district court in the Canal Zone, with a district judge, a district attorney, and various judicial and other officials independent of the Canal-Railroad organization.

Services Rendered to Shipping by the Panama Canal

The principal services rendered to shipping by the Canal and its adjuncts are shown in the following table, which represents a comparison of the activities during the fiscal year 1951 with the 2 years immediately preceding:

	Fiscal year		
	1951	1950	1949
TRAFFIC THROUGH THE PANAMA CANAL			
Number of vessels transiting the Canal:			
Ocean-going tolls-paying vessels.....	5, 593	5, 448	4, 793
Small tolls-paying vessels (see p. 16).....	1, 113	1, 185	1, 275
Total tolls-paying vessels.....	6, 706	6, 633	6, 068
Vessels exempt from payment of tolls (see p. 17).....	1, 045	1, 061	1, 293
Total transits.....	7, 751	7, 694	7, 361
Number of lockages during year:			
Gatun Locks.....	6, 214	5, 883	5, 371
Pedro Miguel.....	6, 383	6, 116	5, 616
Miraflores Locks.....	6, 300	6, 063	5, 623
Tolls levied—ocean-going vessels.....	\$23, 906, 082	\$24, 430, 206	\$20, 541, 230
Tolls levied—small vessels.....	\$52, 797	\$81, 507	\$76, 405
Total tolls.....	\$23, 958, 879	\$24, 511, 713	\$20, 617, 635
Value of tolls on vessels entitled to free transit.....	\$2, 810, 691	\$2, 063, 579	\$2, 487, 792
Cargo passed through Canal, carried by:			
Ocean-going tolls-paying vessels (long tons).....	30, 073, 022	28, 872, 293	25, 305, 158
Small tolls-paying vessels (long tons).....	25, 066	33, 989	31, 975
Vessels exempt from payments of tolls (long tons).....	1, 183, 437	1, 458, 700	2, 245, 455
Total cargo (long tons).....	31, 281, 525	30, 364, 982	27, 582, 588
Net tonnage (Panama Canal measurement) of ocean-going tolls-paying vessels.....	27, 180, 425	28, 013, 236	23, 473, 236
Cargo per Panama Canal net vessel ton (laden ocean-going tolls-paying vessels only).....	1. 311	1. 222	1. 270
Average tolls per ton of cargo (laden ocean-going tolls-paying vessels only).....	\$0. 716	\$0. 737	\$0. 708
OTHER SERVICES			
Calls at Canal Zone ports by ships not transiting the Canal.....	1, 032	1, 219	1, 219
Cargo handled and transferred at ports (tons).....	1, 332, 263	1, 015, 714	1, 189, 266
Coal sales to ships (tons).....	3, 355	11, 566	15, 563
Coal—number of vessels bunkered.....	12	24	36
Fuel oil—total barrels pumped (both incoming and outgoing), excluding Panama Canal use.....	11, 071, 864	9, 557, 829	10, 389, 753
Fuel oil—number of vessels handled.....	2, 509	2, 475	2, 328
Repairs to ships other than Panama Canal equipment:			
Number of vessels repaired.....	801	814	1, 135
Number of vessels drydocked.....	48	76	100
Sales to ships (except U. S. Army and Navy):			
Provisions (commissary sales).....	\$541, 059	\$561, 784	\$1, 029, 970
Chandlery (storehouse sales).....	\$143, 521	\$153, 423	\$199, 301

Net Revenues

During the fiscal year 1951 the revenues from tolls charged to shipping using the Canal were \$23,951,827.98, and miscellaneous receipts amounted to \$169,240.28, a total of \$24,121,068.26. The net appropriation expenses were \$22,731,829.15, resulting in a net revenue of \$1,389,239.11. The business operations under the Panama Canal provided a net revenue of \$637,867.33. Thus the combined net revenues accruing from the Canal and its business units totaled \$2,027,106.44 during the fiscal year 1951, as compared with \$2,830,184.29 in the fiscal year 1950.

Replacements

The past fiscal year marked the close of 37 years of successful operation of the Panama Canal. A very important factor contributing to this creditable record is the care that has been taken to maintain all parts of the Canal structures and equipment in good operating condition.

The capital assets of the Panama Canal as of June 30, 1951, totaled \$706,448,543, which include \$121,579,848 in special item projects and additional facilities, \$399,024,830 in nondepreciable property such as locks, dams, and other concrete structures, \$7,945,333 in defense and excess plant, and \$177,898,532 in depreciable property. Against this investment in depreciable property is an accrued depreciation of \$89,739,923.

The special item projects, additional facilities, and the nondepreciable property require but little expenditure for upkeep. However, the depreciable property requires systematic and orderly replacement as its economic life is exhausted, and appropriations must be made by Congress for this purpose, as well as for the construction of new facilities as need therefor develops.

Section I

TRAFFIC VIA THE PANAMA CANAL AND CANAL OPERATION

STATISTICS ON CANAL TRAFFIC

Ocean-Going Tolls-Paying Traffic ¹

The trend of traffic through the Panama Canal in fiscal year 1951 continued at approximately the same level as in the previous fiscal year. Though net vessel tonnage, Panama Canal measurement, decreased 3.0 percent from the record high of fiscal year 1950, transits increased 2.7 percent and cargo tonnage, the highest of any fiscal year since 1929, increased 4.2 percent in comparison with the previous fiscal year.

The following is a tabulation of the four principal features of traffic for the fiscal year 1951, together with those in the two fiscal years immediately preceding:

	Fiscal year		
	1951	1950	1949
Number of transits.....	5,593	5,448	4,793
Net tonnage (Panama Canal measurement).....	27,180,425	28,013,236	23,473,236
Cargo (tons of 2,240 pounds).....	30,073,022	28,872,293	25,305,158
Tolls.....	\$23,906,082	\$24,430,206	\$20,541,230

Other Traffic

In addition to the 5,593 ocean-going tolls-paying vessels passing through the Canal in the fiscal year 1951, there were 1,113 tolls-paying vessels under 300 net tons, Panama Canal measurement (consisting principally of small banana boats operating in local waters), and 1,045 transits of vessels exempt from payment of tolls, a total of 7,751 transits for 1951, in comparison with a total of 7,694 in the fiscal year 1950 and a total of 7,361 in 1949. The Panama Canal does not compile detailed statistics on small tolls-paying vessels nor on vessels which transit the Canal without payment of tolls; hence, except for the sections appearing under the captions "Small Tolls-Paying Vessels Transiting Canal" and "Vessels Entitled to Free Transit" on pages 16 and 17, the following paragraphs and tables Nos. 29 through 42, in section V, pertain only to ocean-going tolls-paying traffic.

¹ Vessels of 300 net tons and over (Panama Canal measurement) for vessels rated on net tonnage, or of 500 tons displacement and over for vessels rated on displacement tonnage (naval vessels, dredges, etc.).

Traffic Trends

Approximately 81 percent of the net vessel tonnage transiting the Canal in the fiscal year 1951 was employed in eight trade routes. As previously stated, total net vessel tonnage through the Canal in the fiscal year 1951 declined 3.0 percent from the total making transit in the previous fiscal year. The principal variations in the main channels of trade occurred in the United States intercoastal movement which was off 1,940,000 net tons (30.1 percent) because of the practical disappearance early in the year of the mineral oil traffic and a gain of 854,000 net tons (31.6 percent) in the trade between Europe and the west coast of United States/Canada. Cargo moving in the latter trade, as in previous years, is predominately from the Pacific to Atlantic, with the movement in this direction in 1951 making up 78 percent of the combined movement in both directions. A total of 3,209,910 long tons moved from the Pacific to the Atlantic in this trade in 1951, a gain of 817,125 tons, or 34.1 percent in comparison with the movement in this direction in 1950, while from the Atlantic to the Pacific there was a total of 806,117 long tons in 1951 which more than doubled the Pacific-bound movement of the previous year.

The following tabulation presents a comparison of traffic in the eight principal trade routes for the fiscal years 1951 and 1950:

[In thousands of P. C. net tons]

	Fiscal year			
	1951	1950	Increase or (decrease)	
United States Intercoastal:				<i>Percent</i>
Tankers.....	1,214	3,238	(2,024)	(62.5)
All others.....	3,287	3,203	84	2.6
Total.....	✓ 4,501	6,441	(1,940)	(30.1)
East coast United States-west coast South America.....	✓ 4,068	4,139	(71)	(1.7)
East coast United States-Asia.....	✓ 4,142	3,738	404	10.8
Europe-west coast United States/Canada.....	✓ 3,553	2,699	854	31.6
Europe-Australasia.....	✓ 1,842	1,946	(104)	(5.3)
Europe-west coast South America.....	1,845	1,696	149	8.8
East coast United States-west coast Central America.....	1,369	1,197	(128)	(8.6)
East coast United States/Canada-Australasia.....	786	827	(41)	(5.0)
All others.....	5,074	5,030	44	0.9
Total.....	27,180	28,013	(833)	(3.0)

A brief discussion of shipping engaged in these trade routes is given in the following paragraphs:

United States Intercoastal Trade

The United States intercoastal trade ranked first in tonnage among the various routes served by the Panama Canal during the fiscal year 1951. Net vessel tonnage engaged in this trade in the period totaled 4,501,294, a decrease of 1,940,139 net tons from that routed through

the Canal in fiscal year 1950. This decrease in intercoastal tonnage is attributable directly to the disappearance early in the fiscal year 1951 of the mineral oil traffic. This traffic, which in the fiscal year 1950 had accounted for approximately one-half of the intercoastal tonnage, decreased by 62.5 percent in the fiscal year 1951. A gain of 2.6 percent was recorded in the traffic of other than tankers, i.e., dry cargo tonnage. Cargo moving in the United States intercoastal trade in the fiscal year 1951 totaled 5,730,653 long tons, a decrease of 22 percent from that of the previous year. Of this total 2,060,762 long tons were routed from the Atlantic to the Pacific, a gain of 11 percent over tonnage moving in that direction last year; in the opposite direction the cargo movement totaled 3,669,891 long tons, a decrease of 33 percent from the Atlantic-bound movement in the previous fiscal year.

Trade Between East Coast United States and West Coast South America

The trade between the east coast United States and the west coast South America ranked third in volume of net vessel tonnage in the fiscal year 1951, relinquishing the second place position which it had held in the previous fiscal year. In the fiscal year 1951 a total of 4,067,533 net tons of shipping was employed in the trade, a loss of 71,714 net tons or 1.7 percent in comparison with the fiscal year 1950.

Although net tonnage decreased 1.7 percent in comparison with 1950, cargo exchanged by these two geographical areas, totaling 5,063,336 long tons, increased 9.7 percent. This gain involved movements in both directions; that routed from the Atlantic to the Pacific totaling 790,342 long tons, an increase of 1.5 percent, while that shipped in the opposite direction, amounting to 4,272,994 long tons, increased 11.2 percent from the previous year. This increase was attributable to the heavier shipments of iron ore, nitrate of soda, and bananas during the year.

Trade Between East Coast United States and Asia

The trade between the east coast United States and Asia ranked second among the various trade routes in the fiscal year 1951. In that period a total of 4,141,570 net tons of shipping transited the Canal in the transportation of cargo in this trade, an increase of 10.8 percent in comparison with the total of the previous fiscal year. As has been the case in past years, the volume of traffic in this trade was preponderantly from east to west, with 61.6 percent of the net vessel tonnage and 59.8 percent of the cargo tonnage having transited in that direction in the fiscal year 1951.

The combined cargo movement in both directions in this trade during the fiscal year 1951 totaled 4,899,929 long tons, a gain of 690,664 long tons or 16.4 percent over the combined movement of the previous fiscal year. Of this total 2,935,098 long tons were routed from the Atlantic to the Pacific, a gain of 8.0 percent in comparison with the total shipped in that direction in the previous year; from the Pacific to the Atlantic cargo tonnage totaled 1,964,831 long tons, which represents a gain of 473,630 long tons, or 30.7 percent over the Atlantic-bound total in fiscal year 1950. This increase in the Atlantic-bound cargo is attributable primarily to the heavier shipment of sugar from the Philippine Islands over that shipped in fiscal year 1950.

Trade Between Europe and West Coast United States/Canada

Traffic in the Europe-west coast United States/Canada trade ranked fourth among the various trade routes served by the Panama Canal in the fiscal year 1951, accounting for 3,553,247 net vessel tons of shipping, a gain of 31.6 percent in comparison with the volume of the previous fiscal year. As in the past the west to east movement of cargo in this trade was far in excess of that transiting in the opposite direction, the former accounting for 78.4 percent of the combined movement in both directions.

In the fiscal year 1951 cargo routed from western Canada to Europe totaled 1,882,726 long tons, an increase of 18.7 percent from the west-east movement between these two areas in the fiscal year 1950. In the movement from the west coast United States to Europe cargo tonnage increased from 806,263 tons in 1950 to 1,327,184 tons in 1951, a gain of 520,921 tons, or 64.6 percent. Cargo tonnage in the east-west movement in previous years has been relatively light; however, the combined movement of cargo routed in this direction totaling 886,117 long tons more than doubled the cargo tonnage of the previous fiscal year.

Trade Between Europe and Australasia

A total of 1,841,535 net vessel tons passed through the Canal in the fiscal year 1951 in the Europe-Australasia trade, a loss of 5.3 percent in comparison with that passing through the previous fiscal year. The net vessel tonnage moving from east to west in the fiscal year 1951 was 874,391, a gain of 1.3 percent in comparison with the 862,843 tons passing through in the fiscal year 1950; in the opposite direction there were 976,144 net vessel tons which was a decline of 10.7 percent from the 1,083,082 tons passing from west to east in the fiscal year 1950.

Cargo moving between these two areas in the fiscal year 1951 totaled 1,610,774 tons, a decrease of 6.3 percent from fiscal year 1950. The

east-west movement in the fiscal year 1950 amounted to 764,647 long tons against 722,310 long tons in the fiscal year 1950, a gain of 5.9 percent, while that from the Pacific to the Atlantic, totaling 846,127 tons in the fiscal year 1951 was 15.0 percent under the 996,236 tons of the previous fiscal year.

Trade Between Europe and West Coast South America

The trade between Europe and the west coast of South America ranked fifth among the various trade routes operating via the Panama Canal in the fiscal year 1951. In this period this trade contributed 1,844,938 net vessel tons of shipping to Panama Canal traffic, a total which exceeded that of the previous fiscal year by 8.8 percent.

Cargo tonnage moving in both directions between Europe and the west coast South America in the fiscal year 1951 totaled 1,642,209 long tons, a gain of 6.3 percent in comparison with that of the previous fiscal year. Of this total 488,886 long tons were routed from the Atlantic to the Pacific, a gain of 64.0 percent in comparison with the Pacific-bound movement of the previous fiscal year, while in the opposite direction cargo tonnage totaled 1,153,323 long tons, which represented a loss of 7.5 percent from the Atlantic-bound total in the fiscal year 1950.

Trade Between East Coast United States and West Coast Central America/Mexico

The trade between the east coast United States and the west coast Central America/Mexico, which involves almost exclusively shipping engaged in the banana trade, ranked seventh in net vessel tonnage among the various trades served by the Panama Canal in the fiscal year 1951. Net vessel tonnage in this trade totaled 1,368,522, a decrease of 8.6 percent from the 1,496,916 net tons of the previous fiscal year.

The combined cargo tonnage moving between eastern United States and the west coast Central America/Mexico in the fiscal year 1951 totaled 388,848 long tons, a decline of 11.0 percent from the combined movement of the previous fiscal year. Of this total, 340,184 long tons, which comprised 87.5 percent of the combined movement, were routed from west to east, a decline of 13.6 percent in comparison with the east-bound movement of the previous fiscal year; about 93 percent of this cargo movement was made up of banana shipments. In the relatively unimportant movement from east to west in this trade, a total of 48,664 long tons were shipped in the fiscal year 1951, as against 42,691 long tons in the fiscal year 1950, an increase of 14.0 percent.

Trade Between East Coast United States/Canada and Australasia

The trade between the east coast United States/Canada and Australasia was in volume the least important of the eight major trade routes covered in this discussion. In the fiscal year 1951 a total of 786,298 net tons of shipping was employed in the trade as compared with 827,280 net tons in the fiscal year 1950, a decrease of 5.0 percent.

The combined tonnage of cargo in both directions between these two areas in the fiscal year 1951 totaled 962,445 which was slightly below—less than 1 percent—the 965,886 long tons of the previous fiscal year. Cargo moving from the United States (i. e., excluding Canadian shipments) to Australasia in the fiscal year 1951 totaled 543,461 long tons, a decrease of 5.8 percent from similar shipments in the previous fiscal year, while those exclusively from Canada, totaling 72,631 long tons, decreased 2.6 percent. In shipments routed in the opposite direction, there were 230,239 long tons destined to the United States and 116,114 long tons to Canada, increases of 13.7 percent and 32.5 percent, respectively.

Cargo Statistics

The combined movement of cargo in both directions through the Panama Canal in the fiscal year 1951 totaled 30,073,022 long tons, a gain of 1,200,729 long tons, or 4.2 percent, in comparison with the cargo tonnage passing through in the fiscal year 1950. This is the highest movement of cargo through the Canal since the fiscal year 1929, when 30,647,768 long tons made passage and the second highest in the history of the Canal. The heavy cargo movement in 1951 was the direct result of a sharp expansion of shipments from the Atlantic to the Pacific which totaled 11,132,472 tons, an increase of 17.4 percent, in comparison with 1950 shipments in this direction. This is the heaviest Atlantic to Pacific movement of cargo in the history of the Canal. The west-east movement, totaling 18,940,550 long tons, decreased 2.3 percent from the high level recorded in fiscal year 1950.

In tables Nos. 39 through 42, in section V, will be found a comparison of cargo tonnage shipped over the various trade routes, together with summaries of the principal commodities comprising these shipments.

Tolls Receipts

Tolls received and reported to the United States Treasury in the fiscal year 1951 were \$23,958,878.58, which includes tolls amounting to \$52,796.52 on local tolls-paying vessels not included in statistics covering ocean-going tolls-paying traffic. This sum of \$52,796.52 accounts for the difference between \$23,958,878.58 reported to the United States Treasury and \$23,906,082.06 shown in traffic studies in this report.

Nationality of Vessels Transiting Canal

Twenty-nine nationalities were represented in the ocean-going traffic passing through the Canal in the fiscal year 1951, as compared with 28 in the preceding fiscal year. Vessels of United States registry, accounting for 12,469,276 net tons, Panama Canal measurement, ranked first in volume of net tonnage, as has been the case in almost every year during the 37 years the Canal has been in operation. In the first 4 years of operation, and in the fiscal year 1945, British tonnage ranked first and that of United States registry was second. The volume of net tonnage under United States registry in the fiscal year 1951 decreased 13.5 percent in comparison with the previous years' figures, the greater portion of this decrease occurring in the United States intercoastal trade. Transit of tonnage operating under the British flag in the fiscal year 1951, totaling 5,780,215 net tons, ranked next to the United States in importance; this tonnage increased 12.1 percent over the volume recorded in the previous fiscal year.

United States vessels made up 45.9 percent of the total net tonnage in the past fiscal year; British vessels, 21.3 percent; Norwegian, 8.6 percent; Panamanian, 3.7 percent; Honduran, 3.3 percent; Danish, 2.8 percent; and Swedish, 2.4 percent.

Further particulars on traffic by nationality will be found in table No. 31, section V.

Average Tonnage, Tolls, and Tons of Cargo per Cargo-carrying Vessel

The average measurement tonnage, tolls, and tons of cargo per cargo-carrying vessel of 300 net tons and over, Panama Canal measurement, transiting the Panama Canal during the past three fiscal years are shown in the following tabulation:

	Fiscal year		
	1951	1950	1949
Fiscal year averages, per vessel:			
Measured tonnage:			
Panama Canal net.....	4,891	5,163	4,936
Registered gross.....	6,195	6,872	6,67
Registered net.....	3,697	4,104	3,965
Tolls.....	\$4,146	\$4,502	\$4,31
Tons of cargo (including vessels in ballast).....	5,506	5,324	5,338
Tons of cargo (laden vessels only).....	6,387	6,419	6,432

NOTE.—Computation of above averages is based on vessels engaged in normal commerce; craft such as yachts, naval vessels, etc., are not considered.

Steam, Motor, and Other Vessels

The following table shows ocean-going tolls-paying vessels transiting during the past three fiscal years, segregated according to method of propulsion:

	Fiscal year		
	1951	1950	1949
Steamers:			
Oil-burning.....	3,719	3,773	3,164
Coal-burning.....	29	70	89
Motorships.....	1,804	1,580	1,488
Not classified ¹	41	25	52
Total.....	5,593	5,448	4,793

¹ Naval vessels, yachts, etc.

Frequency of Transits of Vessels Through the Panama Canal

During the fiscal year 1951, 1,579 individual ocean-going tolls-paying vessels, representing 29 nationalities, passed through the Panama Canal. In aggregate these vessels made a total of 5,593 transits. The number of transits made by individual ships varied from 1 to 66, and averaged 3.54. The greatest number of transits, 66, was made by the *Ecuador*, a vessel of Ecuadorean registry, engaged in the banana freight service between the port of Cristobal and Ecuador.

Vessels of British registry led in the number of individual vessels transiting the Canal during the year with 490, but ranked second in the number of transits with 1,004; those of United States registry were second in number of individual vessels transiting with 461, but ranked first in the number of transits with 2,203.

Further information on the frequency of transits of vessels will be found in table No. 34, section V.

Gross Tonnage of Vessels

The 5,593 ocean-going tolls-paying vessels which transited the Canal in the fiscal year 1951 included 5,572 vessels rated on net tonnage and 21 vessels rated on displacement tonnage.

Of the 5,572 vessels rated on net tonnage, 2,143, or 38.5 percent, were vessels ranging between 6,000 and 8,000 registered gross tons. The average registered gross tonnage of all vessels was 6,467 as compared with 6,856 in the previous year.

Further information on gross tonnage of vessels will be found in table No. 35, section V.

Principal Commodities

Statistics on commodities passing through the Panama Canal are not precise, because at the time of transit it is not required that

complete manifests of cargo carried by vessels be submitted to the Canal authorities. In lieu of a manifest, the master of each vessel is required to submit a cargo declaration, which is a briefly itemized statement, listing the principal items of cargo carried and showing their ports or countries of origin and destination. These cargo declarations form the basis of the commodity statistics. There is a natural tendency not to list small miscellaneous shipments but to include them under the head of general cargo. Hence, except in the case of commodities commonly shipped in bulk, such as mineral oils carried in tank ships, wheat, lumber, nitrate, etc., aggregate shipments of the various commodities are likely to be in excess of the tonnage reported during the year and shown in the annual summary. Hence, all commodity statistics carried in this report are subject to inaccuracies arising from this source.

The commodity of the greatest volume passing through the Canal from the Atlantic to the Pacific in the fiscal year 1951 was mineral oil, totaling 1,758,830 tons, followed by manufactures of iron and steel, with 1,600,434 tons, and coal and coke, with 866,905 tons. In the opposite direction, leading commodities were ores (various), with 3,722,308 tons; lumber, with 3,574,602 tons; mineral oils, with 1,663,808 tons; wheat, with 1,403,575 tons; nitrate, with 1,371,191 tons; and canned food products, with 1,163,575 tons.

For details on principal commodities passing through the Canal, see table No. 36, section V.

Ocean Passenger Traffic

The following tabulation shows by month the number of passengers, exclusive of transients, disembarking and embarking from vessels at Canal Zone ports during the fiscal year 1951, segregated between first-class and all others, with comparative totals for the fiscal years 1950 and 1949:

	Passengers disembarking			Passengers embarking		
	First-class	Others	Total	First-class	Others	Total
July.....	1,481	143	1,624	1,364	84	1,448
August.....	1,187	104	1,291	1,179	572	1,751
September.....	1,242	48	1,290	1,616	124	1,740
October.....	946	111	1,057	1,026	122	1,148
November.....	756	64	820	486	201	687
December.....	684	104	788	736	98	834
January.....	817	117	934	443	134	577
February.....	775	84	859	602	117	719
March.....	687	39	726	820	129	949
April.....	781	68	849	1,102	99	1,201
May.....	565	135	700	1,298	231	1,529
June.....	1,238	71	1,309	1,383	101	1,484
Total 1951.....	11,159	1,088	12,247	12,055	2,012	14,067
Total 1950.....	13,010	2,999	16,009	16,925	2,632	19,557
Total 1949.....	13,627	2,275	15,902	15,585	1,746	17,331

The following table shows the passenger traffic through the ports of Cristobal and Balboa during the fiscal years 1951, 1950, and 1949:

	Port of Cristobal			Port of Balboa		
	1951	1950	1949	1951	1950	1949
Passengers disembarking	11, 273	12, 593	12, 716	974	3, 416	3, 186
Passengers embarking	12, 543	15, 765	13, 534	1, 524	3, 792	3, 797

A further segregation of the passenger movement for 1951 shows that 10,402 incoming and 12,364 outgoing passengers came from or were destined to ports on the Atlantic, and 1,845 incoming and 1,703 outgoing were brought from or were destined to ports on the Pacific.

Transient Passengers

In addition to the figures shown above of passengers disembarking, there were 45,527 transient passengers brought to the Isthmus by vessels calling at Canal ports during the fiscal year 1951. The 1951 figure is a decrease of 4,460 (8.9 percent) from the number recorded in 1950, and a decrease of 14,387 (24.0 percent) from the number passing through in the fiscal year 1949.

The origin and destination of these transient passengers are indicated in the following tabulation:

	Fiscal year		
	1951	1950	1949
Remaining on board vessels transiting Canal:			
Atlantic to Pacific	19, 505	24, 242	23, 220
Pacific to Atlantic	17, 521	18, 914	22, 947
Remaining on board vessels entering port but not transiting Canal:			
Atlantic to Pacific	8, 393	6, 674	13, 619
Pacific to Atlantic	108	157	128
Total	45, 527	49, 987	59, 914

Small Tolls-Paying Vessels Transiting Canal

Transits of small cargo-carrying vessels and other miscellaneous craft of less than 300 net tons (Panama Canal measurement) or 500 displacement tons (for vessels rated on displacement tonnage) are excluded from statistics on ocean-going tolls-paying traffic, although the vessels are not exempt from the payment of tolls. Transits of these small vessels during the fiscal years 1951, 1950, and 1949 together with the tonnage, tolls, and the amount of cargo carried, are summarized in the following table:

	Fiscal year 1951			Total, fiscal year	
	Atlantic to Pacific	Pacific to Atlantic	Total	1950	1949
Number of transits:					
Rated on net tonnage	580	532	1, 112	1, 183	1, 274
Rated on displacement tonnage	1	1	1	2	1
Total transits	581	532	1, 113	1, 185	1, 275
Panama Canal net tonnage	32, 250	32, 122	64, 372	100, 421	94, 497
Displacement tonnage	360	360	360	777	371
Tolls	\$24, 860. 52	\$27, 936. 00	\$52, 796. 52	\$81, 506. 58	\$76, 405. 06
Cargo (long tons)	6, 469	18, 597	25, 066	33, 989	31, 975

Vessels Transiting Canal Without Payment of Tolls

The following classes of vessels were entitled to free passage of the Panama Canal in fiscal year 1951 and prior years. Vessels owned, operated, or chartered by Governments of the United States and Republic of Panama; war vessels of the Republic of Colombia; and vessels transiting solely for the purpose of having repairs made at the Panama Canal shops. Such vessels are not included in the general statistics pertaining to Canal traffic. Effective July 1, 1951, vessels owned, operated, or chartered by the Government of the United States will not be included in this group.

The following table shows for the fiscal years 1951, 1950, and 1949 the number of transits in each category outlined in the preceding paragraph, and the amount of tolls to which such vessels would have been subject at the prescribed rates if tolls had been charged against them:

	Fiscal year 1951		Fiscal year 1950		Fiscal year 1949	
	Number of transits	Tolls value	Number of transits	Tolls value	Number of transits	Tolls value
Government of:						
United States	1, 008	\$2, 793, 811	1, 020	\$2, 026, 450	1, 265	\$2, 461, 617
Colombia	22	13, 494	34	28, 306	21	15, 444
Panama	4	29	3	21	3	21
Transiting for repairs	11	3, 357	4	8, 802	4	10, 710
Total	1, 045	2, 810, 691	1, 061	2, 063, 579	1, 293	2, 487, 792

Further details on vessels transiting the Canal without payment of tolls will be found in table No. 43, section V.

Data in Statistical Section

Further particulars of traffic through the Canal are presented in section V of this report in the form of tables.

CANAL OPERATION AND MAINTENANCE

Hours of Operation

Dispatching of ships through the Canal is conducted on schedules. Vessels awaiting transit begin moving through the Canal from the terminal ports at 6 a. m. and dispatches are made thereafter from each terminus at intervals of from $\frac{1}{2}$ to 1 hour. The following is a summary of normal arrangements in effect at the end of the fiscal year.

From Cristobal Harbor, first ship at 6 a. m., last at about 4 p. m.; from Balboa anchorage, first ship at 5:30 a. m., last at 3:30 p. m.

Tankers and vessels carrying hazardous cargoes are dispatched at the discretion of the port captain and normally are not permitted to proceed unless they can clear Gaillard Cut before dark.

Lockages and Lock Maintenance

Operating Schedule of Locks

Three operating crews were maintained at Pedro Miguel locks and at Miraflores locks throughout the fiscal year. Four operating crews were maintained at Gatun locks until January 6, 1951, when an additional operating crew was assigned in order to provide 24-hour service during the period of the Atlantic locks overhaul. For the period of the overhaul from January 7 to March 26, 1951, five operating crews were maintained. Upon completion of the overhaul, normal operation was resumed on March 27, 1951, with four operating crews.

Locks Division force continued to work on the 40-hour week basis during the year except for the period of the Atlantic branch overhaul. On January 7, 1951, personnel of the Atlantic branch, and certain specified employees of the Pacific branch, were placed on a 48-hour week basis. Effective with the week beginning March 25, 1951, all Locks Division employees returned to the normal 40-hour workweek.

The following operating schedules were in effect at the locks on June 30, 1951:

Gatun:

Shift No. 1: 7 a. m. to 3 p. m.—8 locomotives.

Shift No. 1X: 7 a. m. to 3 p. m.—6 locomotives.

Shift No. 2: 3 p. m. to 11 p. m.—8 locomotives.

Shift No. 2X: 3 p. m. to 11 p. m.—6 locomotives.

Pedro Miguel:

Shift No. 1: 8 a. m. to 4 p. m.—8 locomotives.

Shift No. 2: 9:30 a. m. to 5:30 p. m.—6 locomotives.

Shift No. 3: 2 p. m. to 10 p. m.—8 locomotives.

Miraflores:

Shift No. 1: 7 a. m. to 3 p. m.—8 locomotives.

Shift No. 2: 9:30 a. m. to 5:30 p. m.—6 locomotives.

Shift No. 3: 3 p. m. to 11 p. m.—8 locomotives.

Lockages

The number of lockages and vessels handled (including Panama Canal vessels) is shown in the following table, by months, for the fiscal year 1951, with corresponding totals for the previous 5 years:

	Gatun		Pedro Miguel		Miraflores	
	Lockages	Vessels	Lockages	Vessels	Lockages	Vessels
<i>1950</i>						
July.....	577	718	592	726	587	725
August.....	555	714	555	726	561	724
September.....	515	608	535	639	531	637
October.....	512	619	518	647	513	641
November.....	481	592	488	602	483	591
December.....	473	584	479	593	475	591
<i>1951</i>						
January.....	474	618	501	649	489	626
February.....	468	626	492	643	487	656
March.....	541	712	558	737	549	726
April.....	527	687	546	718	534	712
May.....	550	734	557	756	548	736
June.....	541	733	552	757	543	740
Total.....	6,214	7,945	6,383	8,193	6,300	8,105
<i>Fiscal year:</i>						
1946.....	6,823	9,901	7,139	10,654	7,076	10,561
1947.....	4,858	6,674	5,155	7,281	5,084	7,221
1948.....	5,197	7,093	5,422	7,578	5,367	7,574
1949.....	5,371	7,500	6,616	7,863	5,623	7,890
1950.....	5,883	7,868	6,116	8,339	5,063	8,308

Total lockages for all three locks were 4.4 percent above the number handled in the previous fiscal year. All chambers were available for service with double culvert at all three locks throughout the year except during the period of overhaul at the Atlantic locks. At Gatun the west chamber was taken out of service for overhaul on January 6, 1951, and traffic was confined to the east chamber, using single culvert, until 6:40 p. m. on February 16, 1951. Overhaul activities were then transferred to the east chamber, and the west chamber returned to service using single culvert; overhaul of the east chamber was completed March 22, 1951, and the east chamber was returned to service. The west chamber was again taken out of service on March 23, 1951, in order to make repairs to concrete sills, wood seals, seal angles, and rubber seals on miter gates Nos. 15 and 16. Work was completed on March 27, 1951, and both chambers were returned to normal operation on March 28, 1951.

The average number of lockages made daily and the average number of vessels handled per lockage during each of the past five fiscal years are shown in the following tabulation:

Fiscal year	Average number of lockages per day			Average number of vessels per lockage		
	Gatun	Pedro Miguel	Miraflores	Gatun	Pedro Miguel	Miraflores
1947.....	13.3	14.1	13.9	1.37	1.41	1.42
1948.....	14.2	14.8	14.6	1.36	1.40	1.41
1949.....	14.7	15.3	15.4	1.40	1.40	1.40
1950.....	16.1	16.7	16.6	1.35	1.36	1.37
1951.....	17.3	17.5	17.3	1.28	1.28	1.27

As shown in the above table, the trend in the average number of vessels per lockage decreased, while the average number of lockages per day increased as compared with previous fiscal years. This reversal of trend is attributed primarily to the larger proportion of the small commercial, Canal, and Army and Navy vessels being handled as separate lockages rather than as tandem lockages as practised in previous years.

Delays to Shipping

The lock operating machinery functioned smoothly throughout the year except for a few incidents of faulty operation or minor failures of equipment. The following summary includes all delays to vessels while transiting the locks due to the incidents mentioned:

	Number of lockages delayed	Aggregate delay caused all vessels
Gatun.....	66	15 hours 47 minutes.
Pedro Miguel.....	16	2 hours 13 minutes.
Miraflores.....	38	6 hours 14 minutes.
Total.....	120	24 hours 14 minutes.

Maintenance and Construction

The modernization of the electrical power and distribution systems of the locks and preparation of plans for the future program were continued. Virtually all of the design work for the Pacific locks has been completed, and the design work for the Atlantic locks, which was begun last fiscal year, is rapidly being brought to completion. At Pacific locks the replacement of cable was approximately 95 percent complete at the end of the year, and 14 new track transformer rooms were in service. Construction was begun on the new transformer houses and tunnel transformer rooms for the Atlantic locks during the year.

Atlantic Locks Overhaul

A major overhaul was accomplished at the Atlantic locks during the fiscal year. Miscellaneous minor maintenance and repair work was performed concurrently in the unwatered chambers within the limits of available time and personnel.

The major items of work accomplished consisted of the following:

(a) Gates Nos. 13, 14, 15, and 16 were unhinged and all bearing plates, pintle and pintle bushings, yokepins and yoke bushings were renewed. Two lower pintle castings were also renewed;

(b) Removal of 56 rising stem valves and 2 nonoperating valves from pits was made to accomplish repairs to both the valves and pits;

(c) Seal segments and rubber seals on 60 cylindrical valves were renewed or repaired;

(d) Six center-wall culvert bulkheads and all culvert screens were removed and repaired;

(e) General repairs were made to miter gates including repairs to gate seals, and gate latching device;

(f) Overhaul of mechanical interlocking control board of control house;

(g) Installation of cathodic protection on north side of miter gates Nos. 1 and 2, and on north and south sides of miter gates Nos. 5 through 20; and testing of installations at the quoin end of miter gate No. 15 and rising stem valves Nos. 226 and 227.

Power for Canal Operation

The table below summarizes and gives pertinent data relative to the electric power generated by the power system of the Panama Canal for the past three fiscal years;

[Kilowatt hours]

	Fiscal year		
	1951	1950	1949
Gross power generated:			
Gatun hydro station.....	91, 576, 200	96, 841, 500	99, 534, 100
Madden hydro station.....	142, 917, 200	154, 592, 500	149, 214, 900
Diesel stations.....	455, 200	608, 700	21, 670, 200
Total generated.....	234, 948, 600	252, 042, 700	270, 419, 200
Consumed in station service.....	2, 497, 435	2, 383, 512	2, 799, 235
Net generator output.....	232, 451, 165	249, 659, 188	267, 619, 965
Distributed to consumers.....	210, 961, 185	225, 776, 281	241, 325, 061
Transmission loss:			
Kilowatt-hours.....	21, 489, 980	23, 882, 907	26, 294, 904
Percent.....	9.2	9.6	9.8
Peak load (kilowatts).....	42, 000	47, 600	48, 900
Date.....	Dec. 19, 1950	July 11, 1949	Jan. 10, 1949

The six Diesel-electric stations were not operated for water conservation purposes during the fiscal year. The gross generated

455,200 kilowatt-hours were used for supplying peak demands and for testing ready availability of these plants for emergency service.

The new governor oil system consisting of two pumps, an air compressor, and control equipment was installed at the Gatun hydroelectric station during the year. Rehabilitation work was performed on generators Nos. 2, 3, 5, and 6.

At Madden Dam hydroelectric station, generating unit No. 2 was removed from service on April 4, 1951, overhauled, and restored to service May 4, 1951.

The rehabilitation of Balboa substation, which was begun in fiscal year 1949, was completed in fiscal year 1951.

The construction of the new Gamboa substation, begun in the previous fiscal year, was brought to completion in the fiscal year 1951.

During the year service was temporarily interrupted at various substations on six occasions. There were 34 transmission line failures during the year, of which 8 were caused by lightning flashover, 2 by line wire breaks, 15 by animal contact, 1 by faulty operation of protective relays, and 8 from undetermined causes.

Water Supply and General Weather Conditions

Water Supply

The water requirements of the Panama Canal for hydroelectric power, lockages, and municipal use are supplied by the Madden and Gatun Lakes, which serve as storage reservoirs for a drainage area of 1,289 square miles. All outflow from Madden Lake, whether spilled at Madden Dam or drawn for the use of the Madden hydroelectric station, flows into Gatun Lake, and, together with the direct inflow from the area downstream from Madden Dam, is available for Gatun Lake uses. The total inflow into Madden and Gatun Lakes during the year ended June 30, 1951, amounted to 260,302 million cubic feet, which is 25 percent above the average inflow for the 37 years since the formation of Gatun Lake. Evaporation losses from Madden and Gatun Lakes totaled 20,165 million cubic feet, leaving 240,137 million cubic feet available for use.

For further details on water supply and expenditures see table No. 44, section V.

STORMS AND FLOODS.—On July 25, 1950, a severe thunderstorm, with wind velocities ranging from 30 to 50 miles per hour, struck the Pacific side of the Isthmus. There was no material damage caused to Canal structures. Norther conditions prevailed from November 25 to 28, inclusive, which produced heavy runoff conditions in the Gatun Lake Basin, resulting in a runoff of 16 billion cubic feet for the 4-day period. The maximum discharge from Madden Dam during the year was 34,150 cubic feet per second on May 21, 1951.

DRY SEASON, 1951.—The 1951 dry season was of approximately 4 months' duration. It is during this period that the inflow into Madden

and Gatun Lakes is not sufficient to provide water for evaporation losses from lake surfaces and for Panama Canal uses. The net inflow into Madden and Gatun Lakes during this period was 26,169 million cubic feet, the highest of record since 1915. Water expenditures for the same period amounted to 49,349 million cubic feet, consisting of 39,923 million cubic feet for Gatun Lake water use, 9,298 million cubic feet evaporation loss from lake surfaces and 128 million cubic feet spilled over Gatun Lake spillway. The dry season draft on lake storage amounted to 13,882 million cubic feet of which 13,076 million cubic feet were drawn from Gatun Lake and 806 million cubic feet from Madden Lake. It was not necessary to use any water-saving methods during this period.

LAKE ELEVATIONS.—During the fiscal year ended June 30, 1951, Madden Lake varied in elevation between a maximum of 253.06 feet on December 19, 1950, and a minimum of 239.59 on September 15 and 16, 1950, a total range of 13.47 feet. Gatun Lake varied in elevation between a maximum of 87.27 feet on December 16, 1950, and a minimum of 83.93 feet on April 26 and 27, 1951, a total range of 3.34 feet. Elevations on June 30, 1951, were 241.45 feet for Madden Lake, and 85.20 feet for Gatun Lake.

RAINFALL.—The rainfall in the Canal Zone during the fiscal year ended June 30, 1951, was generally above normal in most locations. Along the line of the Canal channel, annual totals ranged from 67.22 inches at Balboa Heights at the Pacific terminal to a maximum of 154.38 inches at Cristobal at the Atlantic terminal, 1.87 inches below normal and 24.30 inches above normal, respectively. The month of maximum rainfall was November 1950. The maximum monthly amount recorded during the year was 39.12 inches at Cristobal in November 1950. March was the month of least rainfall. The month of February 1951, normally a dry month, was abnormal in that rainfall at every station was above normal and the weighted mean rainfall for the Gatun Lake Basin was 6.14 inches as compared to the 38-year mean of 1.48 inches.

Air Temperatures

There was little variation in air temperatures throughout the year, no monthly mean at any station departing more than 2.3° F. from the annual mean. Annual means and extremes at Canal Zone stations for the fiscal year are given in the following tabulation:

Station	1951 maximum		1951 minimum		1951 mean (° F.)	Departure (° F.)
	° F.	Date	° F.	Date		
Balboa Heights.....	95	Apr. 13, 1951	66	Jan. 12, 1951	79.9	-0.4
Madden Dam.....	94	May 9, 1951	62	Mar. 13, 1951	79.2	+0.2
Cristobal.....	91	Oct. 3, 1950	70	Feb. 4, 1951	79.2	-1.5

Annual extremes and means on record at the above stations are as follows:

Station	Absolute maximum		Absolute minimum		Annual mean (° F.)
	° F.	Date	° F.	Date	
Balboa Heights.....	97	Apr. 27, 1948	63	Jan. 27, 1910	80.3
Madden Dam.....	98	Apr. 13, 1920	59	Feb. 4, 1924	79.0
Cristobal.....	95	Oct. 18, 1924	66	Dec. 3, 1909	80.7

Winds and Humidity

Wind velocities for the year averaged 6 miles per hour at Balboa Heights on the Pacific coast and 10 miles per hour at Cristobal on the Atlantic coast. Monthly mean velocities at Balboa Heights ranged from 5 miles per hour during September to 9 miles per hour in March. Monthly mean velocities at Cristobal ranged from 6 miles per hour during September to 15 miles per hour during February. The most frequent directions were northwest along the Pacific coast and north along the Atlantic coast. Maximum velocities for 5-minute periods were 29 miles per hour from the northwest on November 28, 1950, at Balboa Heights and 33 miles per hour from the northwest on November 28, 1950, at Cristobal.

The relative humidity averaged 85 percent at Balboa Heights and 84 percent at Cristobal. Monthly means at Balboa Heights ranged from 74 percent in March 1951 to 90 percent in July 1950, and at Cristobal, from 78 percent in March 1951 to 90 percent in December 1950.

Tides

During the fiscal year ended June 30, 1951, absolute tidal ranges at Canal terminals were 20.7 on the Pacific coast and 2.3 feet on the Atlantic coast. At Balboa, the Pacific terminal of the Canal, the following extremes occurred: Highest high water 10.1 feet above mean sea level, lowest low water 10.6 feet below mean sea level, with the greatest range between consecutive tides 19.5 feet. At Cristobal, the Atlantic terminal of the Canal, the following extremes occurred: Highest high water 1.41 feet above mean sea level; lowest low water 0.89 feet below mean sea level, with the greatest range between consecutive tides 2.00 feet.

Seismology

Nine earthquake shock were felt by Canal Zone residents during the fiscal year 1951. All were light and caused no damage in the Canal Zone area. The nine shocks felt were rated in the Canal Zone at the following intensities: Two at intensity I; two at intensity II; four at intensity III, and one at intensity V. The first shock of the

fiscal year rated at intensity III, occurred on July 7, 1950, at 11:27 p. m. Its point of origin was about 40 miles from Balboa. The second shock, rated at intensity III, occurred on September 15, 1950, at 4:48 a. m., with its epicenter about 90 miles from Balboa. The third shock, rated at intensity I, occurred on October 11, 1950, at 1:57 p. m., with its epicenter about 65 miles from Balboa. The fourth shock, rated at intensity III, occurred on December 7, 1950, at 2 p. m., with its epicenter about 55 miles from Balboa. The remaining five shocks had the same epicenter, being about 140 miles from Balboa off the southern coast of Panama. These five shocks, ranging in severity from intensity I through intensity V, occurred between January 4 and 7, 1951. The heaviest shock occurring on January 6, 1951, at 2:52 a. m., was rated at intensity V, and was the heaviest shock felt in the Canal Zone since May 2, 1943. Including the nine shocks which were felt in the Canal Zone, the seismographs at Balboa Heights recorded a total of 206 disturbances during the fiscal year 1951.

Marine Activities

Traffic through the Canal, which reflects to a large extent the volume of work performed by the Marine Bureau, is fully discussed earlier in this report under "Statistics on Canal Traffic."

Harbor Activities

The following table shows the number of vessels handled at docks of the terminal ports of Balboa and Cristobal for the fiscal year 1951 as compared with the two previous years:

	Cristobal, fiscal year			Balboa, fiscal year		
	1951	1950	1949	1951	1950	1949
Number of vessels docked:						
Handling passengers and/or cargo	1, 489	1, 341	1, 235	348	370	343
For all other purposes	1, 347	1, 134	1, 087	396	499	578
Total	2, 836	2, 475	2, 322	744	869	921

Aids to Navigation

On June 30, 1951, there were in service in the Panama Canal and its approaches 762 aids to navigation maintained by the Aids to Navigation Section. These were classified as follows: Acetylene gas-operated, 113; electrically-operated, 339; unlighted, 309. Included in the above are two automatic acetylene gas-operated light-houses, located at Morro Puercos and at Jicarita Island on the coast of Panama in the Pacific approach. Two visits were made to each of these aids during the year for the purpose of inspecting and servicing the equipment.

Accidents to Shipping

The Board of Local Inspectors investigated and reported on 26 accidents to shipping in Canal Zone waters during the fiscal year 1951; a summary of which follows together with a comparison of accidents in the two previous years:

Cause of accidents	Fiscal year		
	1951	1950	1949
Collision.....	1	4	4
Ship struck lock wall.....	8	16	5
Groundings.....	1	2	
Ship struck by lock gates.....		2	2
Ship struck dock.....	3	1	5
Ship struck canal bank.....	7	1	2
Other causes.....	6	4	3
Total.....	26	30	21

Inspections

Complete inspections were made of the hulls, power plants, and equipment of 21 American vessels and 19 foreign vessels, and certificates of inspection were issued. Twenty-eight hulls of commercial, Panama Canal and Panama Railroad vessels were inspected in dry-dock. Seventeen steam boilers were inspected and certificates issued. Eighty air tank pressure vessels and 19 carbon-dioxide fire extinguishing systems were inspected. Annual inspections were made and certificates of inspection issued to 311 motor boats.

Salvage and Towing

During the fiscal year 1951, the following towing and salvage work was performed by the U. S. *Taboga* for private interests:

On July 13, 1950, the tug *Taboga* was dispatched to vicinity of San Jose Island, in the Pacific, to recover anchor lost by the S. S. *Triland*; on October 24, 1950, while engaged in a sealine repair job for the Texas Petroleum Co. at Puerto Somoza, Nicaragua, the tug *Taboga* was dispatched to the assistance of the S. S. *Oregonian* which had become disabled at sea. The helpless S. S. *Oregonian* was taken in tow and towed to the port of Balboa; on February 11, 1951, the tug *Taboga* was dispatched to salvage the S. S. *Manabi*, which was aground on the Quita Suena shoals off the coast of Nicaragua. After successful salvage operations the *Taboga*, with the S. S. *Manabi* in tow, proceeded to Miami, Fla.; en route from Miami, Fla., to Cristobal, the *Taboga* was ordered to proceed to St. Andrews Island, Colombia, to take in tow the S. S. *Sampson*. Upon arrival at St. Andrews Island on February 24, 1951, the S. S. *Sampson* was taken in tow by the *Taboga* which proceeded to the port of Cristobal.

Operation of Tugs

The following statistics summarize the service of tugs used in marine activities (as distinct from dredging) during the past three fiscal years:

	Operating hours, fiscal year			Jobs handled, fiscal year		
	1951	1950	1949	1951	1950	1949
Cristobal.....	6,624	5,861	5,412	4,161	5,270	¹ 4,829
Balboa.....	2,325	3,326	3,708	1,546	2,200	2,490
Total.....	8,949	9,187	9,120	5,707	7,470	¹ 7,319

¹ Corrected figure.

The above table does not include statistics for tugs which were occasionally borrowed from dredging service to assist vessels during emergencies.

Maintenance of Channel—Other Dredging Activities

Dredges were operated throughout the year on the maintenance of the Canal channel, terminal harbors, and on various special projects. In the fiscal year 1951 the total material excavated amounted to 7,514,500 cubic yards. This is 15 percent less than the amount removed in fiscal year 1950 and 28 percent less than the amount removed in fiscal year 1949. The percentage of rock excavated in fiscal year 1951 was 13 percent as compared with 11 percent excavated in 1950 and 6 percent in 1949. A summary of dredging operations and of equipment employed for the year will be found in tables Nos. 45 and 46 in section V.

Ordinary Channel Maintenance—Canal Prism Dredging

ATLANTIC DISTRICT.—A total of 1,455,000 cubic yards of material was removed in maintaining the Atlantic entrance of the Canal channel. This dredging was performed by the pipeline suction dredge *Mindi*, which worked a total of 64½ days removing 1,455,000 cubic yards of material which consisted of 1,203,500 cubic yards of earth and 251,500 cubic yards of unmined rock.

Project No. 8.—This project involves the widening of the existing channel at the lower end of the Gatun locks, in order to provide additional maneuvering room for ships entering or leaving the locks, and also to increase the facility of discharging water from the locks. A total of 79,500 cubic yards of material was removed in maintaining project No. 8. This dredging was performed by the pipeline suction dredge *Mindi* which worked 3½ days excavating 68,000 cubic yards of earth and 11,500 cubic yards of unmined rock.

CENTRAL DISTRICT.—*Gaillard Cut*.—A total of 604,100 cubic yards of material (exclusive of slide excavation) was moved in maintaining Gaillard Cut. This dredging was performed by the dipper dredges *Cascadas* and *Paraiso* as follows:

Equipment	Days worked	Cubic yardage dredged		
		Earth	Rock	Total
<i>Cascadas</i>	110½	268, 200	113, 100	381, 300
<i>Paraiso</i>	63	141, 000	81, 800	222, 800
Total.....	173½	409, 200	194, 900	604, 100

¹ Unmined.

Project No. 13.—This project, which consists of widening Culebra Reach by 200 feet to the westward, was started in January 1935 and has been continued on a low priority basis since that time. A total of 157,300 cubic yards of material, consisting of 83,800 cubic yards of mined rock, 54,600 cubic yards of unmined rock and 18,900 cubic yards of earth was sluiced into the Canal prism to be removed by regular dredging operations. During the fiscal year 1951 dipper dredges excavated 356,000 cubic yards from the project as follows:

Equipment	Days worked	Cubic yardage dredged		
		Earth	Rock	Total
<i>Cascadas</i>	51½	54, 300	189, 100	243, 400
<i>Paraiso</i>	24	24, 000	88, 600	112, 600
Total.....	75½	78, 300	277, 700	356, 000

¹ 99,100 cubic yards shoremined; 178,600 cubic yards unmined.

Gatun Lake.—A total of 4,000 cubic yards of material was removed in maintaining the Gatun Lake section of the channel. This dredging was performed by the dipper dredge *Cascadas*, which spent 1 day removing 2,900 cubic yards of earth and 1,100 cubic yards of unmined rock.

Auxiliary Dredging—Other Projects

ATLANTIC DISTRICT.—*Cristobal Inner Harbor*.—The pipeline suction dredge *Mindi* performed the following inner harbor dredging operations during the year:

Nature of work performed	Days worked	Cubic yardage dredged		
		Earth	Rock	Total
Maintenance, inner harbor.....	53½	1, 024, 100	159, 500	1, 183, 600
Harbor approach.....	54	1, 363, 800	71, 000	1, 434, 800
Total.....	107½	2, 387, 900	230, 500	2, 618, 400

¹ Unmined.

Derrick barge *No. 157*, with a 10-inch centrifugal pump mounted on its deck, operated as a pipeline suction dredge 13½ days removing 2,500 cubic yards of earth from the submerged end of Marine Railway No. 2 in Cristobal Inner Harbor.

Cristobal Outer Harbor.—A total of 2,395,000 cubic yards of material was removed in maintaining the West Anchorage, Cristobal Outer Harbor. This dredging was performed by the pipeline suction dredge *Mindi*, which worked a total of 71 days in excavating 2,363,000 cubic yards of earth and 32,000 cubic yards of rock.

Slides

There was no slide excavation in Gaillard Cut during the fiscal year 1951. Slide activity throughout the cut was approximately the same as in recent years. Movements were observed in six slides during the year. Numerous small breaks occurred which were limited to movements of minor consequence. There was no interference with shipping on account of slides during the year.

Excavation from slides in Gaillard Cut from June 30, 1913, to June 30, 1951, totaled 52,423,500 cubic yards.

Subsidiary Dredging Division Activities

SAND AND GRAVEL.—During the past fiscal year 21,655 cubic yards of sand and gravel of all classes (both run-of-bank and washed) were shipped from the gravel stock pile at Gamboa as compared with 14,851 cubic yards shipped in the previous year. There was no replenishment of the stock pile at Gamboa during the fiscal year 1951.

The Craneboat *Atlas* was in service 17 days excavating 15,770 cubic yards of sand at Chame Point, Republic of Panama. This sand was pumped into barges and delivered at dock No. 7, Balboa, for the Supply and Service Bureau.

HYACINTH CONTROL AND OTHER ACTIVITIES.—The Canal and adjacent waters through Gaillard Cut, Miraflores Lake and Gatun Lake (including all dump areas) were periodically patrolled throughout the year for the purpose of keeping the growth of hyacinths under control. Log booms at the mouth of the Chagres and Mandinga Rivers were maintained to prevent hyacinths, logs, floating islands, and other obstructions from entering the Canal channel during freshets or spilling at Madden Dam. During the year, periodical inspection trips were made at the Chagres, Mandinga, Frijoles, and Azules Rivers and along the shores of Barro Colorado Island, Pena Blanca and Gigante Bays, dumps Nos. 1 to 14, and Miraflores, Pedro Miguel, and Red Tank Lakes. Weekly inspection trips were also made of the Canal channel between Gamboa and Gatun.

It is estimated that 55,653,000 hyacinth plants were destroyed during the past year, of which 19,935,000 were pulled and 35,718,000

were sprayed; of the plants pulled, 6,907,000 were removed by debris cableway. Ninety-three cords of driftwood were removed by the debris cableway during the past year and in addition 170 cords of driftwood were picked up along the banks of the Chagres, Mandinga, and Cocoli Rivers, Gaillard Cut and Gatun, Miraflores, Pedro Miguel, and Red Tank Lakes.

Ferry Service

Thatcher Ferry service was continuous throughout the past year with only two minor interruptions, one of 7 hours' duration and the other of 9½ hours' duration. During these periods of suspended service, all traffic was routed over Miraflores Bridge. This ferry crosses the Canal at the Pacific terminal and connects Balboa on the east bank with Thatcher Highway on the west bank. Service was maintained by rotating the three ferry boats, *Presidente Amador*, *President Roosevelt*, and *Presidente Porras*, on a daily schedule of two ferries in continuous service.

In the following table are shown, the more important statistics relative to operations of the Thatcher ferry for the past three fiscal years:

	Fiscal year		
	1951	1950	1949
Single trips made.....	51,809	33,674	53,793
Vehicles carried:			
Panama Canal vehicles.....	10,237	9,422	10,681
United States military vehicles.....	29,548	22,152	33,995
Commercial trucks.....	95,008	66,156	101,928
Commercial passenger cars.....	154,197	103,601	147,414
Private cars.....	301,308	200,693	255,066
Total vehicles carried.....	590,298	402,024	549,084
Total passengers carried.....	3,131,095	2,215,392	2,922,970

Section II

BUSINESS OPERATIONS

The business enterprises operated by the Panama Canal and by the Panama Railroad Company embrace a number of activities which in the United States would normally be carried on by private enterprise. These activities have been developed to meet the needs of shipping passing through the Canal and of the Canal-Railroad, the armed services, and their employees. The business enterprises include the supply of fuel, provisions, ship chandlery, and repairs to vessels; the provision of public utility services; the maintenance of living quarters, and the sale of food, clothing, and other essentials to Canal and Railroad employees; the handling of cargo and allied operations; the operation and management of a railroad line; and a steamship line between New York and the Isthmus.

The Canal and the Railroad are separate organizations, but the administration of both organizations is vested in the Governor of the Panama Canal, who is also president of the Panama Railroad Company.

PANAMA CANAL BUSINESS OPERATIONS

Business operations of the Panama Canal are conducted separately from operating activities pertaining directly to the transiting of vessels and the government and sanitation of the Canal Zone. The annual appropriation acts for the Panama Canal authorize the expenditure and reinvestment of all moneys received from the conduct of auxiliary business activities, with the proviso that any net profit derived from such business activities shall be covered annually into the Treasury of the United States. During the fiscal year 1951 Panama Canal business operations produced a net revenue of \$637,867.

Mechanical and Marine Repair Work

Gross Revenues

On the basis of revenues received for work accomplished, there was an over-all decrease of 36.9 percent in the volume of business of the Industrial Bureau in comparison with the fiscal year 1950. This decline in business volume was reflected in all classes of revenues.

The more important decreases occurred in the reduction in revenues from the United States Navy and commercial interests, which declined 60.6 and 17.4 percent, respectively, in comparison with the previous fiscal year.

The following table shows the class and source of work for the past two fiscal years:

	Fiscal year 1951		Fiscal year 1950	
	Revenues	Percent of total	Revenues	Percent of total
CLASS				
Marine	\$2, 032, 330	71. 6	\$3, 278, 274	72. 9
Railroad	14, 501	. 5	336, 087	7. 5
Fabricated stock	180, 588	6. 4	234, 724	5. 2
Other work	611, 051	21. 5	645, 868	14. 4
Total	2, 838, 470	100. 0	4, 494, 953	100. 0
ORIGIN				
Panama Canal	1, 206, 952	42. 5	1, 460, 525	32. 5
Panama Railroad	74, 850	2. 6	382, 058	8. 5
Other United States departments:				
Army	114, 198	4. 0	232, 849	5. 2
Navy	514, 107	18. 1	1, 303, 243	29. 0
Air Force	13, 325	. 5	7, 920	. 2
All other	255		400	
Commercial	914, 783	32. 3	1, 107, 958	24. 6
Total	2, 838, 470	100. 0	4, 494, 953	100. 0

Marine Repair Work

The work load for commercial interests continued to follow the declining trend established in the previous fiscal year. This trend, insofar as marine work for private interests is concerned, has resolved into a pattern of having only the minimum essential voyage repairs or the critical emergency or breakdown repairs performed by the Industrial Bureau. Based upon the nature, type, size, and frequency of occurrence of the various jobs of this nature performed during the fiscal year 1951, it is believed that the downward trend in commercial workload will level off and continue at approximately the level obtained in the fiscal year 1951.

The fiscal year 1951 was the first complete year of operation under the consolidation of the Balboa and Cristobal shops at Cristobal, and it is notable that all demands for repairs and services from commercial interests were handled expeditiously, regardless of which side of the Isthmus the work was performed.

The availability of dry dock space at Cristobal shops for commercial use was limited throughout the year due primarily to the large backlog of scheduled repairs to Panama Canal floating equipment and the inactivity of the Marine Railway which was under

repairs for a period of approximately 4 months. There were no serious requests for the use of dry dock No. 1 at Balboa during the year. On several occasions, due to accidents to vessels, either in Canal transit or at sea, this dry dock could have been used but in all cases repairs of a temporary nature were effected which enabled the vessel to continue its voyage.

The normal work load usually provided by the United States Navy declined during the year. The major job accomplished for the Navy was the completion of the floating dry dock AFDM-9 which had been careened for transiting the Canal in the fiscal year 1950. The work provided by the completion of the AFDM-9 plus the major overhaul to three other naval craft and the routine dry docking for miscellaneous repairs to locally based craft provided a valuable backlog of work during the year.

The work performed for the United States Army declined substantially during the year, providing only 4 percent of the total work load. This work, which formerly provided a stable work load for the Industrial Bureau, has declined to such an extent that its importance as a dependable source of work has become quite negligible.

The revenue derived from Panama Canal sources continued to provide the principal support for the Industrial Bureau in the fiscal year 1951. The dry docking, repair and overhaul of Panama Canal floating equipment provided a steady volume of work during the year. The greater part of this work consisted of the dry docking for general repair of the dredge *Mindi*, the ferryboat *Presidente Porras*, and numerous barges for the Dredging Division. Balboa Dry Dock No. 1 was used for the dry docking of two spare mitre gates from the Locks Division for cleaning and painting.

The following statement shows the number of vessels and total "ship days" for each category of vessel repaired for the fiscal years 1950 and 1951:

	Fiscal year 1951		Fiscal year 1950	
	Number of ships	Ship days ¹	Number of ships	Ship days ¹
Commercial.....	729	1,354	697	1,796
U. S. Army.....	9	159	55	395
U. S. Navy.....	63	391	62	923
Panama Canal.....	28	747	60	1,224
Total	829	2,651	874	4,338

¹ Total days consumed in repairing number of ships indicated.

Dry Docks and Marine Railways

The following table summarizes dry dock and marine railway operations during the fiscal year 1951, with comparative figures for the two preceding years:

[Number of vessels dry docked]

	Fiscal year 1951			Fiscal year	
	Balboa Dry Dock ¹	Cristobal Dry Docks and Marine Railways	Total	1950 total	1949 total
U. S. Army.....		9	9	18	25
U. S. Navy.....		12	12	20	16
Commercial.....		27	27	37	58
Total outside interests.....		48	48	75	99
Panama Canal.....		20	20	25	22
Panama Railroad.....				1	1
Grand total.....		68	68	101	122

¹ Balboa Dry Dock is maintained on a standby basis.

Shop Work

Shop work for the fiscal year 1951 consisted of the usual manufacturing work performed for the storehouse, plus fabrication of shore pipe, pontoons, balljoints, and other miscellaneous castings and forgings required by the Dredging Division. For the Locks Division a large number of quoin plates were planed and other miscellaneous parts manufactured for the Atlantic Locks overhaul.

Plant Improvement

The transfer of the various shop machine tools and related equipment which was started in the latter part of the fiscal year 1950 in connection with the consolidation of the Industrial Bureau's shops at Cristobal, was completed in the fiscal year 1951. The steel cradle for the marine railway No. 2, Cristobal shops, was rebuilt and placed in operation during the year. Plant maintenance work was limited to absolutely essential items, and the plant improvement program was reduced to improvements most urgently required.

Electrical Work

The principal activities of the Electrical Division are the operation and maintenance of the electric light and power system, the construction and maintenance of electrical facilities as required by the Panama Canal and other government agencies, and the performance of services for vessels undergoing repairs at the Canal terminals. The Electrical Division operates and maintains the telephone, tel-

egraph, electric clock, and printing telegraph systems owned by the Panama Railroad Company.

Following is a comparison of the two principal classes of expenditures of the Electrical Division for the past three fiscal years:

	Fiscal year		
	1951	1950	1949
Electrical construction and maintenance work.....	\$1, 778, 313	\$1, 757, 350	\$1, 799, 459
Maintenance and operation of electrical power system.....	1, 239, 809	1, 493, 020	1, 456, 618

Among the principal projects of electrical work carried on during the year were the modernization and rehabilitation of the telephone and electrical facilities of the Pacific Locks; reinstallation of air-raid sirens on both the Atlantic and Pacific sides of the Isthmus; installation and relocation of equipment, and alterations and extensions to the electrical system of the Cristobal shops; the rehabilitation of the electrical distribution and telephone systems of the Gatun Locks; the relocation and protection of electrical facilities in the new construction area in Ancon; the installation and maintenance of electric ranges; the relocation of duct line on Whitlock Street, Cristobal; the rehabilitation and modernization of electrical facilities of Sections A, B, and D, Gorgas Hospital; the improvement of street-lighting systems in the various townsites; the wiring and installation of electrical facilities of the newly constructed quarters for both U. S.-rate and local-rate employees.

Information concerning the principal construction projects undertaken and the operation of the power systems are given on page 21 of this report under the general heading of Canal operation. The expenditures shown in the above table include interdepartmental transactions.

Purchases in the United States

The principal purchases of supplies for the Panama Canal were made, as heretofore, through the Washington Office of the Panama Canal; the volume of the purchases is indicated by the following table:

	Fiscal year		
	1951	1950	1949
Number of purchase orders placed.....	9, 440	8, 142	8, 667
Value of orders placed.....	\$14, 012, 903	\$4, 866, 613	\$8, 118, 372
Number of disbursement vouchers prepared.....	13, 619	14, 544	15, 769
Value of above vouchers.....	\$10, 099, 360	\$8, 232, 577	\$12, 262, 553
Number of collection vouchers prepared.....	300	626	680
Value of above vouchers.....	\$650, 292	\$674, 428	\$638, 898
Cash discounts taken.....	\$35, 577	\$24, 431	\$41, 614

Storehouses and Ship Chandlery

In addition to the main functions of requisitioning, storing, and issuing general supplies for the Canal and Railroad (exclusive of the merchandising operations of the Commissary Division), the Panama Canal storehouses sell ship chandlery and other supplies to commercial shipping, as well as to units of the United States armed services. The following figures indicate the volume of material and supplies cleared through the Stores Accounts during the past 3 years:

	Fiscal year		
	1951	1950	1949
GENERAL STOREHOUSES			
Gross revenues—sales and issues.....	\$11, 243, 906	\$10, 604, 991	\$9, 835, 253
Cost of materials, plus operating expenses.....	10, 888, 390	10, 445, 175	9, 545, 261
Net revenues.....	355, 516	159, 816	289, 992
Inventory as of June 30 ¹	11, 085, 795	10, 442, 482	12, 822, 149

¹ This includes all material and supplies of the Panama Canal, by far the greater part of which is in the general storehouses.

Obsolete and Unserviceable Property and Equipment

During the year disposition was made by sale, or by destruction where the items had no money value, of obsolete or unserviceable property and equipment which had an original value of \$901,467. Replacements were made as necessary.

Bulk Petroleum Products

All deliveries of fuel oil, Diesel oil, gasoline, and kerosene to and from storage tanks, for private companies and for the Panama Canal, are made through pipelines and pumping plants owned and operated by the Panama Railroad Company.

In the fiscal year 1951 a total of 11,404,842 barrels of fuel and Diesel oil were handled by the terminal tank farms, as compared with 9,792,523 barrels in the preceding year. The tank farms also handled 57,795,744 gallons of gasoline and kerosene in the fiscal year 1951, in comparison with 41,415,768 gallons in the preceding fiscal year.

See table No. 47, section V, for further statistics on the activities of the terminal tank farms.

Building Construction and Maintenance

The principal projects of building construction for the Panama Canal completed by the Building Division in the fiscal year 1951 are shown in the following paragraphs. Unless otherwise specified, the items listed are new projects:

Ancon-Balboa.—Three type-428, three type-429, four type-430, three type-431, and three type-432 composite quarters, San Juan area; alteration and conversion of one four-family concrete quarters from two-bedroom to three-bedroom type; covered passageways, Balboa high school and junior college; alterations to Balboa commissary, Balboa substation and Civil Affairs building; foundations for clinics-auditorium and obstetrical buildings, Gorgas Hospital.

Diablo Heights.—One type-322, one type-323, and one type-324 masonry quarters.

La Boca.—Covered passageways, occupational high school; refrigerator room, Pacific Bakery; renovation and repairs, La Boca commissary.

Pedro Miguel.—Construct electrical distribution rooms, Pedro Miguel Locks; construct transformer houses and rooms, Pedro Miguel and Miraflores Locks.

Margarita.—Gasoline service station.

Cristobal.—Demolish and replace building No. 5067, Motor Transportation Division; saw mill, Industrial Bureau; alterations to service station; manufacture 1,000 pallets, Terminals Division.

Camp Coiner.—Eleven type-145, five type-146, ten type-147, nine type-148 composite, and two type-136 masonry local-rate quarters.

In addition to the principal projects listed above which were completed during the year miscellaneous work was also performed for the Panama Canal and Panama Railroad Company units, the armed services and employees. The volume of operation as measured in financial terms totaled \$3,667,702, as compared with \$4,280,785 in the fiscal year 1950.

The total volume of work for the past three fiscal years is summarized in the following table:

	Fiscal year		
	1951	1950	1949
For Canal divisions.....	\$2, 732, 690	\$3, 016, 532	\$4, 588, 590
For Panama Railroad Company.....	226, 466	382, 063	225, 615
For other departments of the Government, employees and others.....	708, 546	882, 190	1, 098, 200
Total	3, 667, 702	4, 280, 785	5, 912, 405

Note.—Includes funds spent from capital allotments which are not taken up in net revenues appearing in table 15, sec. V.

Quarters

For U. S.-rate employees.—Replacement of quarters was continued, a total of 29 apartments in 21 houses of 1- and 2-family types having been completed during the year in the Balboa district. During the year an agreement was completed with the Air Force whereby, under a revokable license for a period of 5 years, 22 houses comprising 29

apartments were secured for U. S.-rate quarters accommodations on the Atlantic side. At the close of the fiscal year, 67 apartments, 33 in the Cristobal district and 34 in the Balboa district, were under construction in continuation of the replacement program.

On June 30, 1950, there were 27 applications for family quarters from regular employees in all districts, and on June 30, 1951, 33 applications were on file. These figures represent applications from regular employees for assignment within their official work districts, a few of whom occupy quarters temporarily elsewhere, and all of whom are requesting particular types of quarters. In addition there were 279 applications on file for provisional or temporary assignment from employees of other agencies who are permitted to occupy available Canal quarters in accordance with assignment rules.

Under existing regulations, employees are required to have an assignment to family quarters before permission is granted for their families to come to the Canal Zone.

For local-rate employees.—Construction of new housing was continued during the year, with 52 completed family apartments being occupied in the Camp Coiner area. In addition, four 12-family U. S.-rate quarters in Gamboa were transferred to local-rate use. At the close of the year, there were 182 new apartments in duplex houses in Silver City under construction.

The demand for quarters for local-rate employees still greatly exceeds the supply. As of June 30, 1951, there were 808 applications for family quarters and 478 applications for bachelor quarters, a total of 1,286, as compared with 1,380 on file June 30, 1950.

Motor Transportation

The Motor Transportation Division is charged with the operation and maintenance of motor transportation for the units of the Panama Canal and Panama Railroad Company. The centralization of transportation facilities in this Division and the requirement that it be operated on a self-sustaining basis have been for the purpose of supplying needed transportation at minimum cost to the Panama Canal and Panama Railroad Company. Repair work is also performed for employees, for contractors engaged in work for the Government of the Canal Zone, and for other United States Government agencies.

The public transportation system of privately-owned busses operating under the supervision and control of the Motor Transportation Division continued to carry employees and their families in and between the various towns of the Canal Zone; 63 busses were operating as of June 30, 1951.

Revenues of the division during the past year, including motor repair shop activities, totaled \$1,829,891, and the expenses, \$1,781,730, leaving a net revenue of \$48,161 for the fiscal year 1951.

During the fiscal year 105 cars and trucks were purchased and 50 cars and trucks were retired. At the close of the fiscal year 774 cars and trucks, 31 trailers, and 5 motorcycles were on hand.

Panama Railroad Press

Effective July 1, 1950, the Panama Canal Press became a business unit of the Panama Railroad Company under the title Panama Railroad Press.

The operations of the Panama Railroad Press were continued under the same policies as heretofore. The printing plant carries stocks of materials, and prints such forms, stationery, etc., as are required in connection with the operation of the Panama Canal and the Panama Railroad Company. In addition to regular reproduction and printing work performed for the Panama Canal and the Panama Railroad Company units during the year, the plant supplied printing for the Armed Forces and other Government agencies on the Isthmus.

The following is a summary of the financial operations of the Panama Railroad Press during the past 3 years:

	Fiscal year		
	1951	1950	1949
Gross sales revenues	\$412,356	\$667,464	\$630,145
Total expenses (including cost of materials used in manufacturing and cost of stationery stores processed)	400,428	654,319	614,634
Net revenues	11,928	13,145	15,511

Revenues Derived From Rental of Lands in the Canal Zone

Rentals for building sites and oil-tank sites in the Canal Zone totaled \$65,902 for the fiscal year 1951 as compared with \$61,412 for the fiscal year 1950. Rentals from agricultural land in the Canal Zone totaled \$5,572 as compared with \$7,415 for the preceding fiscal year. At the close of fiscal year 1951 there were 550 licenses covering 1,114 hectares of agricultural land in effect in the Canal Zone. This is a reduction of 38 in the number of licenses as compared with the previous fiscal year and a reduction of 74 hectares in the area held under licenses. This reduction is largely the result of the policy adopted as a health measure in May 1935, that no more licenses for agricultural land would be issued and that holdings under licenses previously granted may not be transferred.

BUSINESS OPERATIONS UNDER THE PANAMA RAILROAD COMPANY

The Panama Railroad Company was incorporated in 1849 under the laws of the State of New York for the purpose of constructing and operating a railroad across the Isthmus of Panama. When the concessions, rights, and property of the New French Canal Co. were purchased in 1904, ownership of the stock of the Panama Railroad Company was transferred to the United States Government. On June 30, 1948, the Company was reincorporated pursuant to section 304 (b) of the Government Corporation Control Act, comprising sections 245 to 256 of title 2, Canal Zone Code. The Governor of the Panama Canal is by statute the President of the Company. Since the operations of the Railroad complement those of the Canal, the designation of the Governor of the Panama Canal as President of the Panama Railroad Company has insured complete coordination of the activities conducted by the two organizations.

As the activities of the Railroad Company are covered in detail in its annual report, only the major features of operation as they relate to Canal administration are included in this section.

In addition to the operations of the trans-Isthmian railroad, the business enterprises conducted by the Panama Railroad Company include the following: A steamship line operating between New York and the Canal Zone; the loading, unloading, storage, and transfer of cargo for shipping interests at the terminal ports; the operation of wholesale warehouses, retail stores, and subsidiary manufacturing plants engaged in the supply of food, clothing, and other essential commodities to governmental agencies and to Government employees and their families; and the operation of oil and coaling plants, hotels, a telephone system, a dairy, and a laundry.

Trans-Isthmian Railroad

The railroad line operates between Colon, the Atlantic terminus, and Panama City, the Pacific terminus. In addition, the railroad serves all activities of the the Panama Canal and of the Armed Forces located between the two terminal cities. Gross revenues from the operations of the railroad proper (not including subsidiary business activities) during the fiscal year 1951 amounted to \$1,548,846 in comparison with \$1,627,920 for the preceding year. Revenue freight totaled 230,112 tons as compared with 219,541 tons during 1950, an increase of 10,571 tons. This decrease in gross revenues, in face of a gain in revenue freight tons, was the direct result of a reduction in the railroad's proportionate share of through ocean freight. This

reduction in tariff, which became effective in the latter part of the previous fiscal year had little effect on the gross revenues of fiscal year 1950, but contributed strongly to the decline in gross revenues in the fiscal year 1951.

Comparative statistics covering the significant features of railroad operations during the past 3 years are presented in the following tables:

	Fiscal year		
	1951	1950	1949
Average miles operated, Colon to Panama	50.93	50.93	50.93
Gross operating revenues	\$1, 548, 846	\$1, 672, 920	\$2, 105, 283
Number of revenue passengers carried:			
First class	120, 771	96, 738	126, 508
Second class	325, 641	220, 792	270, 254
Total	446, 412	317, 530	396, 762
Revenue per passenger-train mile	\$2.03	\$2.27	\$2.67
Revenue per freight-train mile	\$21.21	\$22.72	\$27.49
Passenger-train mileage	167, 485	132, 247	151, 379
Freight-train mileage	47, 463	49, 175	53, 304
Work-train mileage	1, 228	2, 643	3, 695
Total train mileage	216, 176	184, 065	208, 378
Switch locomotive miles	99, 917	102, 480	109, 516

Harbor Terminals

The Terminals Division handles the dock and harbor activities of the Panama Railroad Company at the two terminals of the Canal. The following statistics summarize the results of operations for the past 3 years:

	Fiscal year		
	1951	1950	1949
Total revenues	\$3, 179, 246	\$2, 493, 974	\$2, 621, 919
Total cargo handled and transferred across docks	<i>Tons</i> 1, 332, 263	<i>Tons</i> 1, 015, 714	<i>Tons</i> 1, 189, 266
Cargo stevedored by Panama Railroad Company	1, 338, 255	792, 474	552, 161
Cargo ships handled	2, 442	1, 755	2, 455
Agency services furnished to vessels	26	29	78

Coal and Oil-Handling Plants

Effective July 1, 1950, the oil-handling plants activities were transferred from the Panama Canal to the Panama Railroad Company, and consolidated with the coaling plant operations of the Panama Railroad Company.

The volume of coal and oil plant operations for the past two fiscal years is shown in the following table:

	Fiscal year	
	1951	1950 ¹
Gross revenues.....	\$873, 934	\$294, 330
Coal sold (tons).....	3, 814	11, 860
Coal purchased (tons).....	9, 493	8, 089
Petroleum products handled (barrels).....	14, 208, 682	

¹ Does not reflect Oil Handling Plant operations.

Telephone System

Gross revenues from the operation of telephones, electric clocks, and electric printing telegraph machines totaled \$364,620, as compared with receipts of \$368,360 for the preceding fiscal year.

During the fiscal year 1951, 1,892 telephones were installed and 1,795 were discontinued or removed, resulting in a net increase of 97 telephones for the year. At the end of fiscal year 1951, there were in service 6,184 telephones, as well as 41 electric clocks and 28 automatic printing telegraph typewriters. Telephone calls averaged 119,861 calls per day in the fiscal year 1951 and 104,975 calls per day in the fiscal year 1950 during the sample days tested. This represents an average of 19.3 calls per telephone per day in the fiscal year 1951, as compared with 17.2 in the fiscal year 1950.

Commissary Division

The primary function of the Commissary Division of the Panama Railroad Company is to supply food, clothing, and household goods to meet the needs of United States Government personnel and various Government departments on the Isthmus. In carrying out this function the Division operates wholesale warehouses, cold-storage plants, a laundry, gasoline service stations, and a dairy, as well as retail stores in each of the Canal Zone towns. Sales are restricted to agencies and personnel of the United States Government and others residing in the Canal Zone, except that ice, food, and other essentials may be purchased by commercial steamships passing through the Canal or calling at its terminal ports.

Sales

Net sales for the fiscal year 1951 totaled \$22,015,043, compared with \$24,998,523 for the previous fiscal year. The value of merchandise on hand June 30, 1951, was \$3,979,177 compared with \$3,498,633 at the close of the fiscal year 1950. The ratio of sales to an average monthly inventory of \$5,357,800 indicates a theoretical

stock turnover of once in 12.7 weeks. The distribution of sales for the past three fiscal years is shown in the following table:

	Fiscal year		
	1951	1950	1949
U. S. Government (Army and Navy).....	\$700,397	\$1,654,425	\$2,182,868
The Panama Canal.....	3,051,305	3,158,531	3,772,976
The Panama Railroad Company.....	217,790	263,269	503,501
Individuals and companies.....	658,200	689,576	1,195,550
Commercial ships.....	541,059	561,784	1,029,970
Employees.....	17,635,215	19,562,560	25,102,830
Gross sales.....	22,803,966	25,890,145	33,787,695
Less discounts, credits, etc.....	788,923	891,622	945,930
Net sales.....	22,015,043	24,998,523	32,841,765

Purchases

Purchases during the year aggregated \$17,176,276, an increase of \$405,028 over the previous fiscal year. The following tabulation shows the value of the various classes of merchandise purchased for the past three fiscal years:

	Fiscal year		
	1951	1950	1949
Groceries.....	\$5,592,614	\$5,907,799	\$8,770,902
Candies and tobacco.....	826,876	925,405	1,007,349
Housewares.....	1,653,094	1,070,504	1,678,455
Drygoods.....	2,752,817	2,429,162	3,137,466
Shoes.....	884,298	798,099	848,513
Cold storage.....	1,886,259	2,409,429	4,338,643
Raw material.....	1,186,073	1,187,560	1,848,197
Cattle.....	348,699	438,895	665,807
Milk and cream.....	19,785	68,870	152,262
Dairy products.....	1,248,288	1,482,537	2,406,725
Dairy farm herd.....		52,988	135,164
Gasoline and oil.....	777,473		
Total.....	17,176,276	16,771,248	24,989,483

Hotels

The Hotels Tivoli and Washington were operated by the Panama Railroad Company throughout the year. Effective January 15, 1951, the Hotel Tivoli ceased catering to the general public in accordance with treaty agreements with the Republic of Panama and became a Guest House. Its services are now offered only to those persons having Canal Zone privileges and their guests. These hotels are an essential adjunct to the Canal, providing necessary accommodations for employees, visiting Government officials, and others.

The gross revenue from hotels was \$667,507, as compared with \$857,998 in 1950, and the number of guest days was 56,243 compared with 77,612 in 1950.

Panama Line

The gross operating revenue of the Panama Line for the fiscal year was \$4,917,753, and the gross operating expenses totaled \$5,130,434, resulting in a net loss of \$212,681.

Freight carried during the year totaled 198,929 tons and passengers carried numbered 12,004. Freight for the account of the Panama Canal and other departments of the United States Government in the Canal Zone was carried at tariff rates, but passengers were carried at reductions from tariff rates ranging from 25 to 75 percent.

Section III

ADMINISTRATION

The Panama Canal organization was established, effective July 1, 1950, by the Governor of the Panama Canal by circular No. 760 under powers delegated to him by Executive Order No. 10101 of January 31, 1950, to determine the internal organization of the Panama Canal. By the same circular various functions of the Panama Railroad Company were assigned to Canal units and others to specific company units with the approval of the Board of Directors.

The organization of the Panama Canal which was in effect throughout fiscal year 1951 comprised the Office of the Governor-President, including staff units; four administrative units, namely, Finance Bureau, Personnel Bureau, Administrative Branch and Magistrates' Courts; seven operations units, namely, Civil Affairs Bureau, Health Bureau, Marine Bureau, Engineering and Construction Bureau, Supply and Service Bureau, Community Services Bureau, Industrial Bureau; and the Washington Office of the Panama Canal. The Panama Railroad Company, a Government-owned corporation operating a steamship line between New York and the Canal Zone and a railroad as well as other business enterprises on the Isthmus, was a distinct agency, but was closely affiliated with and operated as an adjunct to the Panama Canal. Two units of this corporation, the Railroad and Terminals Bureau on the Isthmus, and the New York office, were parts of the combined organization.

Office of The Governor-President

By law the Governor of the Panama Canal was President of the Panama Railroad Company. His principal assistant was the Lieutenant Governor, who was also the Second Vice President of the Panama Railroad Company. The Lieutenant Governor was responsible for securing efficiency and economy in the management of all activities of the Panama Canal and as Second Vice President had like responsibilities for the Isthmian activity of the corporation.

This office included an executive secretary with administrative responsibilities in external relations of the two agencies; an executive assistant with administrative responsibilities pertaining to internal administration and coordination; a military assistant, aide to the Governor for liaison with the Armed Forces; and five staff groups for management, legal, safety, and civil intelligence functions.

Administrative Units

There were four administrative units in the revised organization as follows:

Finance Bureau.—The Finance Bureau was responsible for matters relating to accounting, auditing, budget preparation, collection and disbursements, settlement of claims and property and inventory control for the Panama Canal and the Panama Railroad Company.

Personnel Bureau.—The Personnel Bureau was responsible for the administration of personnel functions and practices of the Panama Canal and the Panama Railroad Company, and acted as a liaison agency in personnel matters between the Canal-Railroad organizations and the Civil Service Commission.

Administrative Branch.—The Administrative Branch was responsible for the administration of general office functions, including communications and records, and office services of the Panama Canal and the Panama Railroad Company.

Magistrates' courts.—The magistrates' courts, which are established by law in the Canal Zone for preliminary hearings, and limited civil and criminal actions.

Operations Units

The operations units of the combined Canal-Railroad organization were comprised of eight bureaus designated as follows:

Civil Affairs Bureau.—The Civil Affairs Bureau was responsible for the administration of the police and fire protection units, the Canal Zone schools system, the postal service, the shipping commissioner functions, the immigration service, the public libraries, the public administrator function, the laws and regulations respecting foreign corporations and respecting sales of securities, and the issuance of designated types of licenses.

Health Bureau.—The Health Bureau was responsible for safeguarding health and providing medical and dental care and treatment to authorized persons; supervision and control pertaining to sanitary affairs of the Canal Zone and the maritime sanitation and quarantine in the ports and waters of the Canal Zone; and the administering of health and sanitary matters in the cities of Panama and Colon in conformity with existing treaties and other agreements between the United States and the Republic of Panama.

Marine Bureau.—The Marine Bureau of the Panama Canal was responsible for the transiting of ships through the Canal, the handling of maritime traffic of the terminal ports and all maintenance facilities of the Canal used by shipping; the operation and maintenance of the locks and related installations and facilities; the dredging, maintenance and improvement of the Canal channel, the terminal harbors

and adjacent waters; offshore marine salvage; the establishment and maintenance of buoys and other aids to navigation, and the operation and maintenance of ferries.

Engineering and Construction Bureau.—The Engineering and Construction Bureau was responsible for the design, construction, inspection, and maintenance of buildings and structures, and roads, streets and sidewalks; the construction, installation, operation, and maintenance of public utilities, including water, sewerage, and electric power systems; and the telephone system on the Isthmus.

Supply and Service Bureau.—The Supply and Service Bureau was responsible for the procurement, storage, and distribution of supplies and materials; the operation of warehouses and other issue and service facilities; the operation of central garages and repair shops for motor vehicles; the operation of commissaries, including procurement, warehousing, sales and service; the operation of gasoline service stations, hotels, printing and binding facilities; and the procurement and sale of coal.

Community Services Bureau.—The Community Services Bureau was responsible for the housing of employees, care of public buildings and grounds, clubhouses, the operation of garbage, trash collection, and street-cleaning facilities; the administration and maintenance of cemeteries; the operation of the Experiment Gardens; and transactions relating to the use and occupancy of real estate in the Canal Zone and for certain United States lands in the Republic of Panama.

Industrial Bureau.—The Industrial Bureau was responsible for all matters pertaining to the design, construction, and repair of ships and floating plant; heavy machine work; manufacture of gases; manufacture, inspection, and repair of instruments, machines and equipment of all units requiring the use of mechanical or marine shop, drydock, or repair-wharf facilities.

Railroad and Terminals Bureau.—The Railroad and Terminals Bureau was responsible for the operation of the Panama Railroad, including the maintenance of roadway and rolling stock; operation of cargo piers and docks; marine bunkering; the conduct of steamship agency functions as Canal Zone agent for the Panama Line and for other steamship lines; and the handling of the Company's real estate.

Offices in the United States

The two offices in the United States were as follows:

Washington Office, the Panama Canal.—The Washington Office, the Panama Canal, had charge generally of all duties and functions relating to the business of the Panama Canal in the United States, including governmental and other liaison work; the purchase and inspection of materials and supplies and procurement of services; and the recruitment of personnel in the United States.

New York office.—The New York office of the Panama Railroad Company was under the supervision of the Vice President, who was responsible for the administration, management, and operation of the Panama Line, and the procurement, in the United States, of materials and supplies for the Panama Railroad Company, including the commissaries and other units on the Isthmus.

PROPOSED REORGANIZATION OF THE PANAMA CANAL AND PANAMA RAILROAD COMPANY

Legislation to govern future operations of the Canal and Railroad was enacted in Public Law No. 841, Eighty-first Congress, which provides for the maintenance and operation of the Panama Canal by the present corporate adjunct of the Panama Canal, as renamed; and reconstituting the agency charged with civil government of the Canal Zone. Effective July 1, 1951, under the terms of Public Law No. 841, and upon the promulgation of Executive Order No. 10263, dated June 29, 1951, the revised organizations are to consist of the Panama Canal Company and the Canal Zone Government.

Briefly, the revised organization will be as follows:

The Panama Canal Company.—The Panama Canal Company is the corporation through which all functions other than those of a strictly governmental nature will be performed. The activities of the Company are to be grouped into three main categories, as follows: (1) Canal activities—which will consist of the functions directly related to the Canal as a waterway and to transiting of vessels, including the marine operations, maintenance of Canal channel, operation and maintenance of the locks, and other similar services. (2) Commercial activities—which will consist of the various subsidiary functions serving the Canal activities, employees, and other interests in the Canal Zone. These include all the functions of the present Panama Railroad Company, together with those transferred from the Panama Canal, such as the Canal's supply and service activities, utilities (electric power and water), general repair and construction activities, clubhouse operations, etc. (3) Housing activity—which will furnish housing to employees of the Company and Canal Zone Government in the Canal Zone.

Canal Zone Government.—The Canal Zone Government will include the usual functions of government and public health, such as civil affairs, schools and physical education, police and fire protection, hospitals and other health services, highways and sewers, postal system, and all capital items pertaining to this group of functions.

CHANGES IN ADMINISTRATIVE PERSONNEL

Mr. Edward A. Doolan was appointed Personnel Director on July 1, 1950, vice Mr. Seymour Paul, retired.

Mr. Henry L. Donovan was appointed Community Services Director on July 1, 1950.

Col. George K. Withers, United States Army, was appointed Engineering and Construction Director on July 7, 1950, vice Col. Howard Ker, United States Army, relieved from duty with the Panama Canal.

Mr. Edward N. Stokes was appointed Railroad and Terminals Director on August 1, 1950, vice Mr. Lyle A. Prather, retired.

Mr. Forrest G. Dunsmoor was appointed Executive Assistant to the Governor-President on February 1, 1951, vice Mr. Ernst A. Erbe, retired.

Mr. Jerome F. Prager was appointed Superintendent of Storehouses on February 8, 1951, vice Mr. Walter A. Smith, retired.

Mr. Richard Sullivan was appointed General Manager, Commissary Division, on March 4, 1951, vice Mr. Vincent J. Clark, transferred to the New York office.

Mr. Lewis B. Moore was appointed Supply and Service Director on March 4, 1951, vice Mr. Lew W. Lewis, retired.

Capt. Marvin J. West, United States Navy, was appointed Chief, Navigation Division, on June 1, 1951, vice Capt. Robert S. Bertschy, United States Navy, relieved from duty with the Panama Canal.

FORCE EMPLOYED AND RATES OF PAY

The force employed by the Panama Canal and Panama Railroad Company continued to decrease. A total of 18,792 persons was employed by these 2 agencies as of June 30, 1950, while the force report of June 30, 1951, recorded a total of 18,735, a reduction of 57, or 0.3 percent.

The highly diversified activities of the Canal-Railroad organization include scores of different functions, and almost every conceivable employment category will be found in the organization. For many years only citizens of the United States were eligible for employment in executive, supervisory, professional, subprofessional, and clerical positions. For several years past, however, properly qualified citizens of the Republic of Panama have been eligible for appointment to these positions, in which special educational, training, or other high qualifications are a requisite. The rates of pay for positions in these categories are based on equivalent or closely similar rates prevailing in the Federal service in the United States, plus, normally, 25 percent differential. Effective October 1, 1950, however, payment of the 25 percent differential was discontinued to persons not citizens of the

United States. Positions such as those occupied by semiskilled workers, helpers, laborers, and other positions not requiring the services of highly skilled workers or those requiring special training or other qualifications are included in another group. The rates of pay for employees within the latter group are based generally upon local prevailing rates. The positions in this group are filled mostly by natives of the areas adjacent to the Canal, although a scattering of nationals of many other countries will be found in these positions.

EMPLOYEES PAID AT U. S. RATES

The force of the combined organizations of the Panama Canal and Panama Railroad Company, numbered 4,216 on June 30, 1951, as compared with 4,322 on July 1, 1950, a decrease of 106, or 2.5 percent. The number in each organization at year end is shown in the following tabulation:

	As of June 30, 1951	As of July 1, 1950 ¹	Difference
The Panama Canal	3,637	3,746	-109
Panama Railroad Company	579	576	+3
Total	4,216	4,322	-106

¹ Reorganization was effected July 1, 1950, under authority of Executive Order No. 10101.

The number of full-time employees paid at U. S. rates is shown according to function in table No. 48, section V.

Additions to and Separations from Force

The following table for the Canal-Railroad organization gives a summary of the additions to and separations from the force paid at U. S. rates for the fiscal year 1951:

	Panama Canal	Panama Railroad	Total
Additions	821	117	938
Separations:			
Resignations	674	92	766
To enter military service	1		1
Reduction in force	6	0	6
Termination of temporary employment or reassignment	131	1	132
Revol for cause	3	1	4
Retirement:			
Age	28	6	34
Disability	31	9	40
Optional or voluntary	32	5	37
Separation—disability	7	1	8
Disqualification		1	1
Transfer (to other departments of Government)	1	1	2
Termination (administration policy of Panama Canal, 5 years service, age 62)	2	1	3
Death	4	3	7
Other	3	0	3
Total separations	923	121	1,044
Net separations	102	4	106

NOTE.—In addition to these figures, there were 154 additions and 92 separations of employees on a part-time or irregular basis.

Turnover in Force

Based on an average aggregate force of 4,287 and 1,044 terminations for the year, exclusive of part-time and irregular employees, the total turnover rate for 1951 of this group of employees was 24.4 percent, as compared with a turnover rate of 19.3 percent for the fiscal year 1950. Voluntary terminations for fiscal year 1951 totaled 805, a rate of 18.8 percent, as compared with 8.8 percent in fiscal year 1950. Involuntary terminations for 1951 totaled 239, a rate of 5.6 percent, as compared with 10.5 percent for 1950.

Recruiting

Of the total full-time additions to the force during the fiscal year 1951, 254, or about 27 percent, were effected through United States recruitment, and 684, or about 73 percent were employed through local recruitment. On the basis of 938 full-time employments, the recruitment of this group of employees in the fiscal year 1951 represents an accession rate of almost 22 percent. Including the 154 part-time employees who were added, the accession rate was slightly more than 25 percent, as compared with slightly more than 11 percent for the previous fiscal year. This increase in recruitment may be accounted for, in general, by the replacements necessary as the result of higher turnover among employees.

At the close of the year there were requisitions pending in the Washington Office for 218 employees. Of these, 51 positions were for the Locks Division, 42 for the Engineering Division, 39 for the Schools Division, 32 for the Health Bureau, 18 for the Electrical Division, 15 for the Industrial Bureau, and the remainder to fill miscellaneous vacancies.

Adjustment in Wages and Hours of Work

Revisions in United States rates of pay used as bases for similar positions in the Canal-Railroad organization resulted in one upward revision for policemen; one for postal employees; one for railroad operating personnel; one for railroad nonoperating personnel; two for the floating-equipment group; one for the Panama Railroad Press craftsmen; and six for craft and supervisory employees. A new base was developed for Panama Canal pilots and Power System employees, which resulted in higher rates for these groups.

A more liberal schedule of rates for teachers and kindergarten assistants was approved by the Governor during fiscal year 1951, although not effective until July 1, 1951.

Performance Rating Plan

The Performance Rating Plan, effective December 29, 1950, superseded the Uniform Efficiency Rating in accordance with the Performance Rating Act of 1950. The plan is uniformly applicable to all U. S.-rate personnel within its scope, both craft and classified, and performance ratings are made annually on March 31 for both groups of employees. The three official performance ratings are "Satisfactory," "Unsatisfactory," and "Outstanding."

EMPLOYEES PAID AT LOCAL RATES

The employee force of the combined organizations of the Panama Canal and Panama Railroad Company, as of June 30, 1951, numbered 14,519, as compared with 14,470 as of July 1, 1950, an increase of 49.

The number of local-rate employees of the Canal-Railroad organization as of June 30, 1951, and July 1, 1950, with the differences, is shown in the following tabulation:

	As of June 30, 1951	As of July 1, 1950 ¹	Increase or decrease
The Panama Canal.....	9,002	9,277	-275
Panama Railroad Company.....	5,517	5,193	+324
Total.....	14,519	14,470	+49

¹ Reorganization was effected July 1, 1950, under authority of Executive Order No. 10101.

The number of local-rate employees, by function, will be found in table No. 49, section V.

Wages of Local-Rate Employees

The minimum and maximum rates of this group of employees were 31 cents and \$1.45 per hour, respectively, with a weighted average of 53 cents for hourly rated employees, as of June 30, 1951. Within-grade increases were received by 2,317 local-rate employees in July 1950 and by 2,625 local-rate employees in December 1950; and in February 1951, 274 employees with 10 years continuous service, who were ineligible for promotion due to their pay rate being in excess of the maximum of their grade, were granted increases. In April 1951, the Governor approved a general increase in the local-rate schedule of 5 cents an hour. He also approved, to be effective December 1951, the addition of a new within-grade step to the various grades of the present local-rate wage schedule, and provisions for granting automatic annual within-grade increases to certain categories of employees, thus eliminating the former system of making semiannual merit promotions.

Cash Relief for Disabled Employees Paid at Local Rates

New applications for relief under the act of Congress of July 8, 1937, averaged 49 per month during the fiscal year 1951, as compared with 74 per month in the fiscal year 1950. The regulations established during the latter part of the fiscal year 1938 for administering this relief were continued without material change.

The table below shows the disposition for relief benefits from employees of both the Panama Canal and the Panama Railroad Company during the fiscal year 1951:

	Panama Canal	Panama Railroad	Total
On hand July 1, 1950	23	12	35
Received during fiscal year 1951	428	162	590
Total	451	174	625
Disposition:			
Approved for payment	408	148	556
Rejected or found ineligible	41	26	67
Pending	2	0	2
Total	451	174	625

NOTE.—Removal from the rolls on account of death or subsequent reemployment of cash relief recipients: The Panama Canal, 119; Panama Railroad Company, 48; Panama Railroad pensioners, 4.

Total and annual costs per month during the fiscal year 1951 were as follows:

	Number of cases	Monthly average payment per case	Monthly average payments
Panama Canal rolls	2,063	\$22.31	\$46,020.50
Panama Railroad rolls	771	21.15	16,303.25
Panama Railroad pensioners ¹	63	13.73	865.00
Total	2,897	21.81	63,188.75

¹ Superannuated employees granted cash relief prior to July 8, 1937.

Expenditures on behalf of the Panama Canal cash relief program are paid from annual appropriations for that purpose, while those of the Panama Railroad Company constitute a continuation of the former plan of granting cash relief to the superannuated employees of that Company and are paid by the Panama Railroad Company.

During the fiscal year 1949, studies were completed looking toward the amendment of the act of July 8, 1937, commonly referred to as the Cash Relief Act. As a result, legislation was requested, as outlined in the annual report for fiscal year 1949, and at the end of fiscal year 1951 this legislation was still pending.

Repatriations

In 1934 an appropriation of \$150,000 was provided for the repatriation of former local-rate employees (and their families) who have rendered at least 3 years service to the United States Government or the Panama Railroad Company on the Isthmus. During the fiscal year 1951, \$17,603 was expended for the repatriation and rehabilitation of 175 former employees. To the end of the fiscal year 1951, the original \$150,000 had been spent in its entirety, plus an additional \$7,624 from other funds allocated for that purpose.

CENTRAL LABOR OFFICE

The Central Labor Office program of the Panama Canal provides for eligibility control over applicants seeking employment with Government agencies and private contractors operating on Government work in the Canal Zone. A slight increase in local-rate force of the agencies served by the Central Labor Office is indicated by the comparative figures presented in the following table, showing the total number of employees paid at local rates of pay carried on the rolls of the various organizations as of June 1951 and June 1950, the increase in total force being 4.65 percent:

	June	
	1951	1950
Panama Canal and Panama Railroad Company.....	14, 519	14, 470
U. S. Army.....	3, 232	3, 045
U. S. Air Force.....	408	335
U. S. Navy.....	1, 445	973
Government contractors and miscellaneous.....	1, 169	1, 027
Total.....	20, 773	19, 850

NOTE.—The figures in this table are based on reports submitted by the various cooperating agencies, which form the basis for prorating the expense of the Central Labor Office.

Because of the insufficient supply of qualified labor on the Isthmus to handle the heavy construction program carried on during the war emergency, the Panama Canal was forced to resort to recruitment of contract laborers from the Republic of Colombia, Jamaica, Costa Rica, and El Salvador. With the diminishing need for outside labor after the cessation of hostilities, most of these workers have been repatriated to their native countries. From the inception of the foreign recruiting program in 1940, 22,265 contract workers were brought to the Isthmus, of which 22,191 have been returned to their native countries, leaving as of June 30, 1951, a total of 74 remaining on the Isthmus.

LONG-RANGE HOUSING CONSTRUCTION PROGRAM

The long-range housing construction program, submitted by the Governor in the previous fiscal year, and approved by the Bureau of the Budget and Congress, proposed the construction of new units to replace the existing deteriorated and unsatisfactory living quarters for the Panama Canal and Panama Railroad employees in the Canal Zone.

Briefly, the program covers the replacement of all dwelling units in old frame buildings erected during the period of construction of the Canal and into World War I years, and in temporary frame buildings erected during World War II, all of which conform to construction-camp rather than reasonably modern, permanent standards.

To provide sufficient and adequate sites for quarters it will be necessary to develop two new townsites on the Pacific side and to extend and enlarge the existing townsites of Margarita and Paraiso. The entire program including public facilities and community services such as commissaries, clubhouses, schools, etc., is presently estimated to cost \$80,000,000.

In the fiscal year 1951, an appropriation of \$2,500,000 was made to initiate this program by expenditure for site preparation and quarters construction within the existing townsites on both sides of the Isthmus. In the fiscal year 1952 it is proposed to construct 205 U. S.-rate apartments in the towns of Ancon, Balboa, Diablo, Gatun, and Margarita, and 316 local-rate apartments in the towns of Silver City and Paraiso.

SAFETY PROGRAM

The principal duties of the Safety Branch are the development, improvement, and supervision of adequate safety programs in all functions of the Canal-Railroad organization; to seek out and eliminate the causes of accidents; and through safety education, safety engineering, and the enforcement of safe operating procedures, to reduce the frequency, severity, and cost of accidents. The frequency rate for the fiscal year 1951 showed a 9 percent improvement over the frequency rate of last year, but was 2 percent greater than the lowest rate established in 1949. For the first time in the history of the organization there were no fatalities occurring in the performance of duty. On the basis of the 1950 national average of 1 occupational fatality for every 3,704 workers employed, as reported by the National Safety Council, this is the equivalent of 5 lives saved. During the fiscal year 1951 there was 1 injury resulting in permanent total disability and 13 injuries which caused permanent partial disability. A severity rate of 0.75 established a new low severity rate for the Canal-Railroad organization, which is a 40 percent improvement over the previous low established in fiscal year 1948.

The following statistics cover the accident rates for the Canal-Railroad organization for the 11 full fiscal years since the inauguration of the safety program:

Year	Man hours	Disabling injuries	Frequency rate ¹	Time charges	Severity rate ²	Number of Fatalities
1941.....	72,725,000	5,750	79	214,170	2.94	21
1942.....	92,429,000	4,978	54	238,628	2.58	27
1943.....	94,325,000	3,585	38	230,914	2.45	28
1944.....	80,499,000	2,770	34	158,770	1.97	17
1945.....	70,108,000	2,347	33	90,159	1.29	6
1946.....	61,510,000	1,440	23	81,007	1.32	8
1947.....	51,696,000	1,252	24	79,821	1.54	4
1948.....	45,338,000	1,058	23	56,225	1.24	4
1949.....	40,505,000	663	16	58,479	1.44	4
1950.....	36,492,000	670	18	46,868	1.28	3
1951.....	36,174,000	604	17	27,059	0.75	0

¹ Frequency rate is the disabling injuries per million man hours worked.

² Severity rate is the time charges, in days, per thousand man hours worked.

The annual injury and death compensation rates per \$1,000 payroll, as reported in previous fiscal years, are no longer comparable in view of the added benefits, including increases from \$116.66 to \$525 in monthly maximum compensation payments and certain retroactive features, provided by Public Law No. 357, Eighty-first Congress, approved October 14, 1949, amending the Federal Employees Compensation Act. Total direct costs for the fiscal year 1951 were \$274,215.35; however, 72 percent of this amount was for injuries and fatalities that occurred in prior fiscal years, as shown in the following table:

Fiscal year	Compensation	Leave and other	Medical and hospital	Total
All prior.....	\$182,927.84	\$1,830.65	\$11,620.10	\$196,378.59
1951.....	24,490.63	12,329.49	41,016.64	77,836.76
Total.....	207,418.47	14,160.14	52,636.74	274,215.35

Payments in many of these prior cases will continue for several years; however, these payments would have been materially higher except for the progress that has been made in accident prevention since inauguration of an effective safety engineering program.

GROUPS MAINTENANCE

The Grounds Maintenance Division, established July 1, 1950, as a unit of the Community Services Bureau, performed the municipal function of trash and garbage collection, street cleaning, care of grounds, and maintenance of cemeteries. The consolidation of these duties in one unit resulted in much closer supervision of their performance with a corresponding improvement in service.

Experiment gardens.—The Canal Zone plant introduction gardens and experimental station, established in June 1923, operated as a unit of the Grounds Maintenance Division during the fiscal year. The gardens, which include greenhouses, nurseries, and experimental plantings are devoted to the propagation and cultivation of a wide variety of useful and ornamental plants from all parts of the world, primarily for the purpose of determining their adaptability and value under local soil and climatic conditions, for general propagation on the Isthmus. This unit also designs and supervises all landscape work for the Panama Canal and the Panama Railroad Company, and does landscape work for other Government agencies on the Canal Zone. The landscape section was engaged in 43 projects during the fiscal year 1951. The principal projects undertaken by this section were preparation, sodding, and planting of Panama Canal quarters building sites.

CLUBHOUSES

The Panama Canal clubhouse unit operates restaurants, motion picture, bowling, and other recreational facilities for United States Government personnel, their families and guests. The clubhouses are self-supporting and for a number of years no appropriations have been required for these activities.

Several changes were made in clubhouse units during the fiscal year in interest of operating economy and efficiency. The more important of these changes were alterations to the dining room of the Diablo Heights clubhouse for cafeteria use, and additional interior changes which provided space for a dance and party room, second floor library space, and the renovation of other public areas; removal of the soda and luncheonette section in the Cristobal clubhouse and alteration of the dining room to provide cafeteria service; relocation of the clubhouse activity in a portion of the present post-office building at Pedro Miguel and demolition of the old clubhouse building; the innovation of combining the activities of clubhouse units with those of the commissaries in the same building, in the interest of securing a more economical and efficient use of space, was effected with the consolidation of the Chagres and Gatun clubhouses and commissaries in this manner.

Plans were approved during the year for the relocation of the general manager's office from the Ancon theater building to the Diablo Heights clubhouse upon the closing of the Ancon theater. At the close of the fiscal year the removal of the general manager's office and the transfer of the concessionaires was underway.

The Division continued to work very closely with the Canal Zone Recreational Committee to assure the success of the summer recreation program for children of the Canal Zone. Various live stage

shows were booked for presentation at clubhouse theaters for the purpose of raising money for the program. Through this medium funds were raised for use by the committee in the purchase of supplies and equipment.

The volume of business of the Division as a whole decreased 8.6 percent from the preceding year. This decline in business necessitated a sharp reduction in force, as well as the institution of other economies such as reducing hours of operation, curtailing services, etc.

LEGISLATION

Among the laws enacted by the Congress during the fiscal year 1951 which relate to or apply in the Canal Zone or affect the Panama Canal and which are of importance and interest are those described below:

An act approved August 9, 1950, authorizing the control of the anchorage and movement of foreign-flag vessels in United States waters, and the safeguarding of vessels, harbors, ports, and waterfront facilities, when the national security is endangered.

An act approved August 26, 1950, to protect the national security by permitting the summary suspension of employment of civilian officers and employees.

An act approved August 28, 1950, the Social Security Act amendments of 1950, which, among other things, extended the old-age and survivors insurance system to certain Government employees.

An act approved September 8, 1950, the Defense Production Act of 1950.

An act approved September 23, 1950, the Revenue Act of 1950, to amend the Internal Revenue Code so as, among other things, to extend the Federal income tax to Government employees in the Canal Zone, effective as of January 1, 1950.

An act enacted September 23, 1950, over veto, the Internal Security Act of 1950.

An act approved September 26, 1950, to authorize and provide for the maintenance and operation of the Panama Canal by its corporate adjunct, renamed the Panama Canal Company; and to reconstitute the agency, renamed the Canal Zone Government, charged with the civil government of the Canal Zone.

An act approved September 30, 1950, the Performance Rating Act of 1950.

An act approved February 21, 1951, the Renegotiation Act of 1951, concerning the renegotiation of national defense contracts.

Legislation relating or of interest to the Canal Zone introduced during this fiscal year and still pending in Congress on June 30, 1951, includes:

Four bills (H. R. 94, H. R. 533, H. R. 936, and S. 1287) to extend the benefits of the Panama Canal construction service annuity law of May 29, 1944, as amended.

Five bills (H. R. 242, S. 433, H. R. 1172, H. R. 3604, and H. R. 3804) to eliminate the retroactive application of the income tax to Government employees in the possessions, including the Canal Zone.

Three bills (S. 1140, H. R. 3305, and H. R. 3688) to create a Department of Health and to transfer to such department certain hospital, medical, and public health functions, including Panama Canal hospitals, dispensaries, and health services.

Two bills (S. 1208 and H. R. 4116) to provide for the administration and sale of certain lands held by the United States in the Republic of Panama.

A bill (S. 1271) to permit employees of the Canal Zone Government and the Panama Canal Company to appeal decisions under the Federal Employees Compensation Act to the Employees Compensation Appeals Board.

A bill (S. 1440) to exclude certain teachers, policemen, and firemen in the service of the Panama Canal from the Federal Employees Pay Act of 1945, as amended.

A bill (S. 1680) to amend the Cash Relief Act of July 8, 1937, and to provide for the retirement of certain noncitizen employees of the Panama Canal and the Panama Railroad Company on the Isthmus.

Two bills (S. 1758 and H. R. 4486) to provide for a cost-of-living increase in the rates of compensation of policemen and firemen employed by the Panama Canal.

Two bills (S. 1759 and H. R. 4416) to extend certain special provisions of the Civil Service Retirement Act to fire fighting and fire-prevention personnel, with specific reference to the Canal Zone.

A bill (H. R. 1771) to amend the Canal Zone Code in reference to survival of causes of actions.

A bill (H. R. 2434) to make the Classification Act of 1949 applicable to the Panama Railroad Company or its successor.

A bill (H. R. 2798) to save certain causes of actions affected by the act of July 12, 1949, which excluded the Panama Railroad Company from the Federal Tort Claims Act.

A bill (H. R. 3630) to permit vessels engaged in the coastwise trade of the United States to pass through the Panama Canal without payment of tolls.

A bill (H. R. 4105) to provide that in the application of reduction-in-force regulations under the Veterans' Preference Act of 1944 to locomotive engineers of the Panama Railroad Company, service performed in other civilian positions shall be disregarded.

CAPITAL ALLOTMENTS, FISCAL YEAR 1951

The appropriation for the fiscal year 1951 carried \$3,149,900 for improvements and betterments and for the replacement of worn-out or excessively deteriorated facilities as follows:

Quarters for employees.....	\$2, 500, 000
Sewerage disposal—Pacific side.....	482, 400
Extension of cell block, Canal Zone Penitentiary.....	108, 500
Road and street replacements.....	34, 000
Miscellaneous minor improvements.....	25, 000
Total.....	3, 149, 900

Brief comment on these projects is given below:

Quarters for employees.—This appropriation is to be expended on quarters for both U. S.-rate and local-rate employees. The dwelling units for which replacements are being provided under this program are in old dilapidated frame buildings, most of which date from the construction period of the Canal. The arrangement and facilities of the best quarters of this group were designed for minimum construction-camp requirements of almost 40 years ago. Some are in buildings originally erected for other purposes and since remodeled into dwellings because of the pressing need for accommodations.

Sewage disposal—Pacific side.—This appropriation is to be expended for the provision of adequate, coordinated sewage disposal and collection facilities on the Pacific side. The existing problem arises from the practice of collecting all sanitary and storm drainage in a combined sewer and carrying off by gravity to the nearest body of water. Because of the prevailing flat grades and high intensity of rainfall, it was necessary to have many large outfalls along all water courses and along the ocean and harbor frontage. This has resulted in a number of open sewers and wide-spread pollution of water front and unsatisfactory functioning of the combined sewers. Through an over-all coordinated sewage collection system, all sewage will be separated and the sanitary sewage will be collected at central locations for disposal.

Extension of cell block, Canal Zone penitentiary.—This appropriation was used to provide additional cells to relieve the overcrowded conditions which have prevailed in the Canal Zone penitentiary, and to permit safe and humane confinement of prisoners serving penitentiary sentences.

Road and street replacements.—This appropriation was used in connection with a long-range program for modernizing the narrow and deteriorated streets and roads of the Canal Zone. The majority of these streets and roads were built to pre-1924 standard, and are not suited for the weight, volume, and higher speed of traffic now using them.

Section IV

GOVERNMENT

The government of the Canal Zone is conducted as prescribed in the Panama Canal Act of August 24, 1912, and subsequent acts and Executive orders applicable to the Canal Zone. Whenever practicable, governmental functions have been assigned to departments in the organization established for the operation and maintenance of the Canal. Complete cooperation and increased efficiency are derived from such coordination of functions.

Data on expense and revenues of various features of Canal operation and government are contained in the financial and statistical statement in section V of this report.

AREA OF THE CANAL ZONE

The total area of the Canal Zone ¹ as of June 30, 1951, with areas segregated for various purposes, is shown in the table below:

Land area:

Military and naval reservations (inclusive of licenses and assignments):	<i>Square miles</i>
Military reservations.....	91. 00
Naval reservations.....	11. 47
Total.....	102. 47
Canal Zone townsites and areas outside of townsites in active use...	13. 59
Miscellaneous assigned land areas:	
Barro Colorado Island.....	5. 71
Forest preserve (excluding Madden Road).....	5. 38
Cattle pastures.....	39. 90
Commercial licenses.....	4. 67
Garden plots.....	. 12
Total.....	55. 78
Swamps.....	15. 16
Remaining usable land.....	185. 49
Total land area of the Canal Zone.....	372. 49
Water area:	
Fresh water.....	186. 07
Tidewater (Atlantic and Pacific within 3-mile limits).....	89. 45
Total water area of the Canal Zone.....	275. 52
Total area of the Canal Zone.....	648. 01

¹ Excludes small tracts which are noncontiguous to the main Canal Zone.

POPULATION

By compiling information obtained from the Housing Division, the Real Estate unit, the Army, Air Force, and Navy authorities, and by making a house-to-house canvass of persons employed by commercial interests, an estimate was made in March 1951 of the population of the Canal Zone. The estimated population figures include civilian employees of all governmental agencies and their families and members of the families of Army, Air Force, and Navy personnel residing in the Canal Zone, but omits uniformed personnel of those services.

The following is a summary of the population by districts:

	Americans			All others			Total
	Men	Women	Children	Men	Women	Children	
Balboa district.....	3, 445	5, 069	5, 791	4, 032	3, 495	5, 821	27, 653
Cristobal district.....	937	1, 181	1, 660	3, 347	2, 087	4, 221	13, 433
Total, 1951.....	4, 382	6, 250	7, 451	7, 379	5, 582	10, 042	41, 086

The total of 41,086 represents a decrease of 5,375, or 11.6 percent, in comparison with the number reported in the house-to-house canvass of March 1949. A complete census was taken in April 1950 as part of the seventeenth decennial census of the United States. Since this census did not segregate civil and military population, no direct comparison can be made with the canvass of the civil population taken in March 1951.

PUBLIC HEALTH

The health of the Canal Zone populace continued relatively good during the fiscal year 1951. Excluding malaria and venereal disease, the average number of reportable diseases per month for the fiscal year was 100 as compared with 153 during the previous fiscal year, and 36 per month during the fiscal year 1949.

The malarial rate for employees of the Panama Canal and Panama Railroad Company for fiscal year 1951 was 1.5 per thousand, as compared with 2.2 per thousand in fiscal year 1950, and 4.6 per thousand for the fiscal year 1949. Malarial-control measures in contiguous areas of the Republic of Panama, that may affect our rates, were seriously disrupted because of changes of administration and lack of insecticides at the beginning of the rainy season. The pasturing of cattle in approximately 1,000 acres of swampy lands in Mindi Dairy has created a difficult malaria sector control problem on the Atlantic side. House flies at landfills for garbage, both at Mount Hope and Old Panama, have developed marked resistance to currently available insecticides such as DDT, Benzene Hexachloride, Dieldrin, and Chlordan. Serious consideration is being given to converting

the garbage landfills into conventional sanitary fills, especially the one located at Mount Hope, where ample cover is available.

No *Aedes aegypti* mosquito breeding was found in the Canal Zone or the terminal cities during the past year.

A smallpox vaccination campaign was conducted by the forces of the respective health officers in the terminal cities during March, April, and May 1951. The results are given in the following table:

	Estimated population	Vaccination	Percent of population vaccinated
Panama City.....	121,400	77,715	64
Colon.....	50,000	31,409	63
Canal Zone, Atlantic (local rate).....	8,750	7,225	83
La Boca.....	4,267	2,624	61
Red Tank.....	1,934	1,811	94
Paraiso.....	1,586	1,128	71
Gamboa.....	2,270	2,037	90

Vital Statistics

General death rates.—The death rate for the Canal Zone is artificially low because residence in the Canal Zone is largely restricted to a selective group, i. e., Government employees and members of the Armed Forces and the immediate members of their families, and because ex-employees generally leave the Isthmus after retirement. Below are shown death rates by yearly periods for the past five calendar years:

Death rate per 1,000 population—all causes

	Calendar year				
	1950	1949	1948	1947	1946
Canal Zone ¹	6.47	5.83	5.60	6.00	6.31

¹ Omits Army, Air Force, and Navy personnel.

² Corrected figure.

Principal causes of death.—The principal causes of death in the Canal Zone, together with the rate per thousand population, were as follows:

Number of deaths and annual rate per 1,000 population—calendar year 1950

	Number	Rate per 1,000
Organic diseases of the heart.....	28	0.681
Tuberculosis.....	14	.341
Cancer.....	34	.827
Nephritis.....	17	.414
Diseases of the arteries.....	25	.608
Pneumonia.....	14	.341

Birth rate.—In the Canal Zone a change in the birth rate, as distinct from the number of births, has only limited significance, because of the unusual situation which exists with regard to the population on which the rate is calculated. For the past 10 years, population figures have excluded uniformed personnel of the Armed Forces, but have included members of their families. Children born to Armed Forces families therefore are included in the total number on which the rate is calculated.

A factor which depresses the birth rates concerns local-rate personnel in the Canal Zone. Canal Zone quarters are generally available only to such employees who have more than average length of service and they and their wives are, therefore, predominantly in the older age brackets. The following table shows the birth rates in the Canal Zone for the past 5 years:

Birth rate per 1,000 population ¹

	Calendar year				
	1950	1949	1948	1947	1946
White.....	51.71	50.81	53.23	55.92	44.69
Colored.....	23.08	21.29	22.41	19.17	18.92
Combined.....	35.66	35.79	37.20	36.32	29.42

¹ Canal Zone rates are based on civilian population in each group.

Death rate among children under 1 year of age.—The following table shows the infant mortality rates in the Canal Zone per 1,000 births for the past 5 years:

Death of infants under 1 year of age per 1,000 live births

	Calendar year				
	1950	1949	1948	1947	1946
White.....	22	11	19	14	17
Colored.....	49	40	47	45	63
Combined.....	32	20	27	23	34

Malaria

The rates for malaria among employees only for the past 10 years are shown below:

Calendar year	Rate per thousand	Calendar year	Rate per thousand
1941.....	14	1946.....	12
1942.....	25	1947.....	12
1943.....	15	1948.....	6
1944.....	13	1949.....	3
1945.....	13	1950.....	1

There were no deaths from malaria among employees during the calendar year 1950.

Hospitals

The number of patient days in Panama Canal hospitals for the past three fiscal years was as follows:

[Number of patient days]

	Fiscal year		
	1951	1950	1949
Gorgas Hospital.....	173, 310	203, 210	204, 786
Corozal Hospital:			
Insane.....	93, 539	95, 778	94, 078
Cripples and chronic medical and surgical cases.....	36, 919	37, 062	37, 285
Colon Hospital.....	34, 699	47, 879	55, 762
Palo Seco Leper Colony.....	43, 139	41, 264	41, 628
Total.....	381, 606	425, 193	433, 539

Quarantine

During the fiscal year 1951 inspection was made of 7,304 vessels and 1,409 airplanes, as compared with 6,893 vessels and 4,600 airplanes in the previous year.

No cases of quarantinable diseases (plague, typhus, yellow fever, smallpox, and cholera) on arriving vessels were reported in advance of arrival or detected at quarantine inspection. One vessel was detained at the port of Cristobal for 3 days because of an epidemic of influenza during its current voyage.

Airplane inspection was limited to planes arriving in the Canal Zone and carrying nonmilitary passengers. Planes arriving at Tocumen airport in the Republic of Panama were not inspected by Canal Zone quarantine authorities.

MUNICIPAL ENGINEERING

Municipal work carried on during the year included the construction and maintenance of roads, streets, and sidewalks, and the operation and maintenance of the water and sewer systems in the Canal Zone, including reservoirs, filter plants, and pump stations. The maintenance of the water system, sewer system, and the streets in the cities of Panama and Colon, and the furnishing of filtered water to these municipalities, were also handled by the Municipal Division. Construction work was performed and services rendered for units of the Panama Canal, the Armed Forces, the Government of the Republic of Panama, and for various individuals and companies. Only the major items of this work are commented upon in this report.

Water System

The consumption of filtered water for municipal uses and for sales to vessels during the past three fiscal years is given in the table below. The cities of Panama and Colon, Republic of Panama, used approximately 50 percent of the total amount consumed.

[Thousands of cubic feet]

	Fiscal year		
	1951	1950	1949
Canal Zone.....	684, 822	795, 748	889, 562
City of Panama.....	548, 115	544, 274	553, 323
City of Colon.....	155, 268	158, 812	166, 303
Sales to vessels.....	18, 618	18, 070	18, 446
Total.....	1, 406, 823	1, 516, 904	1, 627, 634

Regular maintenance work was performed on the pipelines, reservoirs, filtration plants, and pumping stations during the year.

Sewer System

In addition to the regular sewer maintenance, consisting of cleaning and flushing lines, cutting tree roots, replacing defective pipe, etc., renovation and repairs were made to the concrete box sewers along Barneby Street and Amador Road to protect the structural strength and to correct the poor flow conditions that were brought about by deterioration of the concrete invert.

Roads, Streets, and Sidewalks

Regular maintenance work was performed on the Canal Zone roads, streets, and sidewalks during the year. In addition there were a number of minor paving projects, the more important involving the resurfacing of Frangipani Street from Ancon Boulevard to Gorgas Road, Ancon; the resurfacing of Gorgas Road from Herrick Road to Mamei Place; and the construction of a parking area in the rear of the Balboa Post Office, Balboa.

Other Heavy Construction Activities

The work which was begun in the fiscal year 1950 on the construction of the steel cradle for marine railway No. 2, Cristobal shops, replacing the existing wooden cradle, was substantially completed during the year.

Work was begun on the laying of the 72-inch interceptor sewer and connections in the Balboa area; this work consisted of the excavating, shoring, and installation of the 72-inch reinforced-concrete pipe and lesser size connecting pipe and was under way at the close of the year.

Grading, clearing, and preparing of areas for the U. S.-rate and local-rate townsites were performed, as well as service work in connection with the new quarters construction during the year. The most important of these projects included the grading of Margarita Extension and the Ancon Boulevard-Chagres Street area involving 135,000 and 157,272 cubic yards respectively of earth and rock excavation.

Cities of Panama and Colon

Regular maintenance work was performed on the water and sewer systems, and on the streets during the year. The principal improvement projects undertaken during the year were the repaving of La Iseca and "A" streets in the vicinity of the National Stadium, Panama City; the replacement of water lines on Forty-third, Forty-fourth, and Forty-fifth Streets, Panama City; the complete paving of Thirteenth Street from Roosevelt Avenue to Gorgas Drive and Gorgas Drive from Twelfth to Thirteenth Streets, Colon; and the installation of curbs for street intersections in the Colon Fill development.

Miscellaneous Activities

Sosa Hill quarry and rock-crushing plant.—Rock crushed during the fiscal year 1951 and issued to various units of the Panama Canal, Panama Railroad Company, units of the Armed Forces, the Republic of Panama, and to individuals and companies, totaled 42,650 cubic yards. In addition, this plant produced approximately 3,990 tons of asphaltic mixtures for placement on street surfaces.

Central mixing plants.—During the year 29,887 cubic yards of ready-mix concrete were produced.

Concrete pipe plants.—These plants manufactured 2,234 linear feet of various sized concrete pipe, both plain and reinforced, in addition to varying quantities of concrete valve boxes, valve box covers, and cement blocks.

Testing laboratories.—The Miraflores laboratory made tests throughout the year as required, including chemical and bacteriological analyses of water, concrete tests, hydrocarbon tests, and chemical analyses and physical tests on various materials, to determine their suitability for Panama Canal use. Tests were also conducted to determine the presence or absence of asphyxiating, explosive, or deleterious gases in the holds of ships and oil tanks. This laboratory also conducts soil tests and analyses.

The materials-testing laboratory for special projects was transferred to the Engineering Division, effective October 1, 1950. For the period of the fiscal year that the laboratory was connected with this Division the program of protective coatings and material corrosion studies was continued.

PUBLIC ORDER

Arrests

During the fiscal year, 5,798 arrests were made, a decrease of 32.2 and 27.4 percent in comparison with fiscal years 1950 and 1949, respectively. Statistics covering these arrests, with corresponding figures for the two previous years, are given in the following table:

	Fiscal year		
	1951	1950	1949
Male.....	5,267	7,854	7,366
Female.....	531	699	619
Total.....	5,798	8,553	7,985
Arrests made with warrants.....	718	1,105	1,047
Arrests made without warrants.....	5,080	7,448	6,938
Total.....	5,798	8,553	7,985
Residents of the Canal Zone.....	1,948	2,910	2,739
Residents of Panama.....	3,629	5,294	4,838
Transients.....	221	349	408
Total.....	5,798	8,553	7,985

Principal Causes of Arrest

There were 6,107 charges filed against persons arrested during the fiscal year 1951, of which 5,891 were misdemeanors and 216 were felonies, the latter representing 3.5 percent of the total offenses charged. The following were the principal causes of arrest:

Cause of arrest (charge)	Fiscal year		
	1951	1950	1949
Violation of traffic regulations.....	3,458	6,134	5,043
Trespassing.....	569	614	584
Petit larceny.....	337	266	337
Loitering.....	288	350	563
Intoxication.....	216	266	248
Vagrancy.....	213	276	302
Fugitive from justice.....	176	160	212
Disturbing the peace.....	134	182	154
Battery.....	116	127	171
All others.....	600	769	824
Total.....	6,107	9,144	8,438

Coroner's Investigations

A total of 77 deaths were investigated by the coroner during the fiscal year 1951. Of these 21 required formal reports of inquest which established that 16 were accidental, 1 homicidal, 3 suicidal, and 1 was undetermined.

Prisoners

During the year the number of prisoners serving sentences in the Canal Zone jails averaged 50.5 per day. All physically able prisoners were employed in useful work.

There were 54 convicts committed to the Canal Zone penitentiary, a decrease of 2 from the number committed in the preceding year. Sentences imposed upon convicts totaled 151 years. Seventy-nine convicts were discharged leaving 92 in custody at the end of the year. Computed at standard rates of pay for common labor, the value of labor performed by convicts during the year amounted to \$65,908. Of this amount, 66 percent represented the value of work performed in the operation, maintenance, and improvement of the penitentiary buildings and grounds; 21 percent on the penitentiary farm; and the remaining 13 percent on outside work.

Deportations

By order of the Governor, 21 persons were deported from the Canal Zone during the fiscal year, all of whom had served sentences in the penitentiary and whose continued residence in the Canal Zone was regarded as undesirable.

Traffic Accidents

A total of 572 traffic accidents was reported during the fiscal year 1951, as compared with 741 in the previous fiscal year. The most common causes of accidents in the fiscal year 1951 were "reckless driving," "failure to use caution meeting and passing," "failure to exercise caution when backing," and "following too closely," these accounting for 60 percent of the total. Four persons were killed and 204 injured in traffic accidents during the fiscal year 1951, compared to 11 persons killed and 207 injured during the fiscal year 1950.

MAGISTRATES' COURTS

The following is a summary of the business transacted at the magistrates' courts for the subdivisions of Cristobal and Balboa for the fiscal year 1951, together with comparative figures for the fiscal year 1950:

	Cristobal		Balboa		Total	
	1951	1950	1951	1950	1951	1950
Cases handled:						
Criminal.....	2, 109	2, 452	3, 605	5, 950	5, 714	8, 402
Civil.....	14	8	39	36	53	44
Total.....	2, 123	2, 460	3, 644	5, 986	5, 767	8, 446
Disposition of criminal cases:						
Conviction.....	1, 924	2, 299	3, 235	5, 680	5, 159	7, 979
Acquittal.....	55	58	70	115	125	173
Dismissal.....	100	54	228	75	328	129
Held for district court.....	30	48	72	82	102	130
Total.....	2, 109	2, 459	3, 605	5, 952	5, 714	8, 411
Convictions in which execution of sentences was suspended and defendants placed on probation.....	113	101	122	125	235	226
Rearrested for violating terms of probation.....	7	2	10	7	17	9
Revenues.....	\$17, 812	\$22, 429	\$32, 376	\$54, 444	\$50, 188	\$76, 873

PARDONS AND REPRIEVES

The Pardon Board, consisting of five members appointed by the Governor, acts in an advisory capacity in the consideration of requests submitted by prisoners for executive clemency. During the fiscal year 1951, the Board considered 80 applications for executive clemency, 75 of which were for commutation of penitentiary and jail sentences and 5 for revocation of orders deporting persons following service of sentences and imprisonment. Recommendations for or against clemency were submitted to the Governor in each of such cases, and clemency was extended in 13 of these cases.

Effective March 1, 1951, Dr. Lawrence Johnson was appointed a member of the Board to succeed Mr. E. A. Erbe, retired; Dr. George E. Hesner was appointed alternate for General Rice, succeeding Dr. K. L. Courtney, resigned; Mr. A. C. Medinger was appointed general alternate in lieu of Dr. Lawrence Johnson; and Mr. F. G. Dunsmoor was appointed general alternate to succeed Mr. W. R. Rounsaville, resigned.

FIRE PROTECTION

During the year 216 fires were reported involving property valued at \$2,642,367, with damage estimated at \$55,790. In addition to the fires reported, the Fire Division responded to 53 false alarms and 33 emergency calls, 14 of which involved saving of lives.

The following table classifies the owners who suffered property losses during the year, as compared with the previous year:

	Fiscal year 1951		Fiscal year 1950	
	Number of fires	Property loss	Number of fires	Property loss
The Panama Canal.....	103	\$2,096	163	\$14,451
Panama Railroad Company.....	20	380	19	57,739
U. S. Army.....	13	-----	3	140
U. S. Navy.....	4	-----	5	70
U. S. Air Force.....	1	-----	-----	-----
Private (including ships).....	75	53,314	43	17,874
Total.....	216	55,790	233	\$90,274
Total property involved.....	\$2,642,367		\$9,044,980	

PUBLIC SCHOOL SYSTEM

The public school system for white children includes nine kindergartens; eight elementary schools, grades 1 through 6; one elementary school, grades 1 through 5; two junior high schools, grades 7 through 8; two senior high schools, grades 9 through 12; an apprentice school; and a junior college. Public schools for colored children include six kindergartens; seven elementary schools, grades 1 through 6; four 3-year junior high schools, grades 7 through 9; two occupational high schools, grades 10 through 12; and a junior college.

Enrollments

The schools for white children operate on a 9-month basis, while the schools for colored children are open 10 months each year. February enrollments are used for purpose of comparisons, since they usually represent the enrollment peaks. In February 1951, 4,368 pupils were enrolled in the white elementary and secondary schools, grades 1 through 12, and 3,592 in the colored schools, grades 1 through 12, compared with 4,511 and 3,412, respectively, in February 1950. The kindergarten enrollments were 569 white and 354 colored in February 1951, as compared with 514 and 291, respectively, in February 1950.

For the past 3 years the average daily attendance has been as follows:

	Fiscal year		
	1951	1950	1949
White schools.....	4, 171	4, 335	4, 244
Colored schools.....	3, 377	3, 245	3, 104

NOTE.—Junior college and kindergartens not included.

February enrollments of day-time students in the Canal Zone Junior College numbered 149 as compared with 206 in February 1950. The extension division of this school offered adult classes during three terms, viz, October 1950 through January 1951; February 1951 through May 1951; and June 1951 through August 1951. The extension division served a total of 855 individuals, not including duplications, about 316 less than were enrolled in the 3 sessions of the previous year. There was no summer session at Cristobal. The courses offered at the Balboa center numbered 23, 21, and 7, respectively, for the three terms; those at Cristobal numbered 2 for the two regular terms.

Achievement

The achievement tests which have been administered to the pupils of grades 1 through 8 in white and colored schools for many years and have been used as a means of comparison between Canal Zone pupils and those in the United States, were given in September in the colored schools and in October in the white schools. On the basis of the standard achievement tests administered, the average eighth grade white pupil was 7 months above United States norms. In the cooperative tests in senior high school subjects administered at the close of the second semester, the median pupil in 23 tests scored at a point equivalent to the fifty-ninth percentile, as compared with the sixtieth percentile in the previous year.

Curriculum

The general curriculum revision program begun in 1948 was continued through the year. Work in curriculum revision was continued in the fields of arithmetic and the social studies. A general planning committee for the revision of courses of study in arithmetic drew up an outline, including grade replacement, for the introduction of the various skills and suggestions as to teaching procedures. This general plan will guide revision in arithmetic next year. Revision in the social studies progressed to the point where study units for teacher use were in preparation. A workshop course was set up in the summer institute for colored teachers for the purpose of completing study units at all grade levels. It is expected that these units will be drawn together into teaching manuals by committees in the white schools during the coming year.

Building Program

The boys' gymnasium at Balboa was repaired and partly remodeled providing a new hardwood playing floor, bleacher seats, an amplifying system, and an electric scoreboard. Covered passageways to permit student movement from class to class during the rainy season were constructed between the junior high school and junior college building at Balboa; between the high school and shop buildings at La Boca; and between the junior and senior high schools at Silver City.

Physical Education and Recreation

Physical education classes for both white and colored pupils are conducted by the Physical Education and Recreation Branch. In addition, personnel from this section provide leadership and guidance for the Boy and Girl Scout organizations on the Isthmus and supervise such sports and recreational activities as baseball, basketball, handball, football, tennis, boxing, fencing, archery, athletic meets, swimming, and water safety.

The Summer Recreation program which had formerly been the joint responsibility of the Physical Education Branch and the Clubhouse Division was assigned to the Physical Education and Recreation Branch of the Division of Schools.

POSTAL SYSTEM

Twenty post offices were in operation by the Bureau of Posts during the fiscal year 1951. Of these, 11 were in civilian localities, 5 in Army localities, 1 in an Air Force Base, and 3 on naval reservations.

Operations for the past 3 years are summarized in the following table:

	Fiscal year		
	1951	1950	1949
Receipts:			
Sale of airmail postage	\$288,357	\$301,346	\$381,394
Sale of other postage stamps, postal cards, stamp books, etc.	199,061	213,743	218,743
Money order fees	53,220	58,617	52,134
Box rents collected	36,157	45,453	49,650
Handling mail—other agencies	13,500	13,500	13,500
Other receipts	340	372	473
Total receipts	590,635	633,031	715,894
Expenses:			
Transportation charges for air mail	140,321	137,081	168,705
All other charges and expenses	653,820	656,234	664,951
Total expenses	794,141	793,315	833,656
Net surplus (deficit)	(203,506)	(160,284)	(117,762)
Transferred from postal savings interest account	125,000	200,000	
Reported surplus (deficit)	¹ (78,506)	39,716	¹ (117,762)

¹ This operating deficit was absorbed by reserve funds.

Statistics relative to the operation of the Canal Zone postal system for the past three fiscal years are covered in the following table:

	Fiscal year		
	1951	1950	1949
Registered and insured articles handled:			
Sent	107,343	114,234	141,392
Received	136,594	116,736	175,231
Dispatches of steamship mail handled:			
Cristobal:			
Number sent	2,510	3,379	3,214
Number received	2,854	3,571	3,059
Balboa:			
Number sent	(¹)	(¹)	(¹)
Number received	171	121	135
Dispatches of air mail handled—Balboa:			
Sent	14,756	16,216	19,864
Received	16,354	17,952	21,419

¹ Effective Oct. 1, 1947, the dispatching of mail for South and Central America from Balboa was discontinued and that function transferred to the Cristobal exchange office.

IMMIGRATION VISAS

During the fiscal year 1951, 273 visas were issued by the Executive Secretary to alien residents of the Canal Zone traveling to the United States. Of these, 11 were quota immigration visas, 168 nonquota immigration visas, 73 were nonimmigrant visas, and 21 were transit certificates. Fees collected for visas amounted to \$1,817.

RELATIONS WITH PANAMA

Because of the close relations existing between the Governments of the Canal Zone and the Republic of Panama and the proximity of the areas, numerous matters of mutual interest arise continually. During the year, correspondence and discussions pertaining to the

transaction of matters of this kind were conducted between representatives of the Panama Canal and the Panamanian Government. The majority of these matters related generally to such subjects as customs, immigration, repatriation of aliens, municipal improvements, public health, postal service, and extradition.

CUSTOMS AND IMMIGRATION

On July 1, 1950, the immigration function, which in prior years had been performed by the Health Bureau, was transferred to the Civil Affairs Bureau as a part of the Postal, Customs, and Immigration Division. The work load of the immigration function was divided into two distinct operational segments. The first involving the immigration inspection of passengers and passenger documentation was delegated to the Customs. The second concerning matters of immigration control was delegated to the newly created Immigration Control Section. This section is also charged with the operation of the immigration detention station at Corozal.

The following is a statistical summary of the more important items handled by the Customs during the fiscal year 1951, together with corresponding figures for the two preceding years:

	Fiscal year		
	1951	1950	1949
Vessels entered.....	14, 148	13, 553	12, 558
Vessels cleared.....	14, 149	13, 547	12, 574
Aircraft entered.....	(1)	1 834	3, 824
Aircraft cleared.....	(1)	1 843	3, 825
Customs releases on shipments consigned to Panama.....	11, 709	9, 686	7, 710
Invoices certified for shipments to United States.....	673	1, 167	1, 380
Chinese passengers arriving.....	(2)	62	137
Chinese admitted to Panama.....	(2)	33	20
Vessels with Chinese crews checked.....	(2)	2, 545	1, 051

¹ Commercial air activities transferred to Tocumen National Airport, Republic of Panama, September 1949.

² Provision of Executive Order No. 4214, excluding Chinese from Canal Zone, revoked October 1950.

Canal Zone customs officers have been stationed at the National Airport in the Republic of Panama since the transfer of commercial air activities to that airport from the Canal Zone on September 21, 1949, to inspect baggage of passengers destined for the Canal Zone, and to release air express consigned to the Canal Zone.

SHIPPING COMMISSIONER

The shipping commissioner and his deputies have the same authority with respect to United States seamen as shipping commissioners in the United States ports and United States consuls in foreign ports. There were no sick or destitute seamen maintained or returned to the United States at Government expense during the year, but 129 were

signed on vessels as workaways, and returned to the United States without expense to the Government.

The total wages earned by seamen who were discharged at Canal Zone ports amounted to \$145,077 and the total approved for deduction on account of advances, allotments, fines, slopchest account, etc., was \$62,591. The balance of \$82,486 was either paid to seamen under the supervision of the Deputy Shipping Commissioners or received on deposit for the seamen by the Deputy Shipping Commissioners. The wages, money, and effects of four American seamen who died in the Canal Zone were handled by the Shipping Commissioner during the year. Their personal effects, and cash amounting to \$231.67 were remitted to the proper courts for disposition.

ADMINISTRATION OF ESTATES

The Public Administrator takes charge of all estates requiring administration within the Canal Zone that are not handled by others legally entitled to administer them. In cases of estates with total assets exceeding \$1,000 in value, the public administrator charges the regular commissions fixed by law, which are paid into the Treasury of the United States. Commissions amounting to \$3,086 were collected during the fiscal year. The estates of 106 deceased or insane persons, with cash assets of \$63,716 were settled during the fiscal year.

FOREIGN CORPORATIONS

Foreign corporations doing business in the Canal Zone are required to have licenses, and 132 such corporations, the majority of which are steamship lines, steamship agencies, and government contractors, were licensed during the fiscal year 1951. Fees amounting to \$1,320 were collected.

INSURANCE

The license fee for insurance companies doing business in the Canal Zone is \$10 per year plus a tax of $1\frac{1}{2}$ percent on premiums collected. At the end of the fiscal year 29 companies were licensed to write insurance in the Canal Zone.

Life-insurance companies reported that as of December 31, 1949, 3,219 policies were in force. During the calendar year 1950, 827 policies were issued and 909 were canceled, leaving 3,137 with an aggregate value of \$11,176,527 in force as of December 31, 1950. Premium collections on life insurance during the calendar year 1950 totaled \$291,587. Claims settled during the year totaled \$48,743.

During the calendar year 1950 premiums received by miscellaneous companies, including accident, automobile, liability, fire, surety, fidelity, etc., but excluding life insurance, amounted to \$671,888. Losses paid during the year totaled \$206,656.

The tax of 1½ percent on premiums paid by all classes of insurance companies amounted to \$14,466 for the calendar year 1950 as compared with \$14,770 during the previous year.

LICENSES

The number of motor-vehicle licenses and transfers issued during each of the past three fiscal years and the aggregate fees collected therefor are summarized below. These include licenses for official vehicles for which no charge is made:

	Fiscal year		
	1951	1950	1949
Vehicle licenses issued	16,045	27,913	27,958
Motor vehicle transfers	6,182	8,375	7,744
Total	22,227	36,288	35,702
Fees collected	\$74,495	\$131,336	\$134,562

Section V

FINANCIAL AND STATISTICAL STATEMENTS

Financial statements of major interest relative to the Panama Canal abstracted from the annual report of the Finance Bureau, are presented in this section. Also included are tables concerned with traffic through the Canal, and other features of Canal operation.

ACCOUNTING SYSTEM

Public Law 841, Eighty-first Congress, changed the name of the Panama Railroad Company to the Panama Canal Company and authorized the Company to "maintain and operate the Panama Canal." Public Law 808, Eightieth Congress (the act incorporating the Panama Railroad Company) made provision whereby assets could be transferred from other Government agencies to the Panama Railroad Company.

The effect of these laws has been to authorize the transfer of the primary activities of the Panama Canal to the corporate organization known as the Panama Canal Company and the transfer was accomplished by Executive Order No. 10263, dated June 29, 1951, effective July 1, 1951. This reorganization will entail a major change in the accounting and in the accounting procedures heretofore followed in the Panama Canal.

During the course of fiscal year 1951, many phases of the pending change were reviewed, and prospective procedures worked out in order to permit the change-over effective July 1, 1951, as expeditiously as possible. Probably the greatest amount of work was devoted to valuation of the capital assets of the Panama Canal for transfer to the Panama Canal Company. For this purpose a survey was carried on throughout the year to appraise the value and utility of the Panama Canal's assets as measured by the capital and depreciation records.

In all cases wherein the worth of a given asset to the company is determined to be less than its net book value (capital less accrued depreciation), the loss in value is reflected by an "economic valuation reserve." The economic valuation reserve plus the accrued depreciation on a given asset reduces the net carrying value of the asset to a figure approximating its appraised worth or utility. In the case of plant that is entirely surplus and hence not used at all, the net carrying value is reduced to zero.

As a result of the extensive capital survey, a great number of adjustments were made during fiscal year 1951 in the capital account of the Panama Canal. Following are four of the more important entries in terms of dollar value; these are representative to a certain extent of the great number of other adjustments made during the year:

(a) Write out of capital account for "Special Item Projects" expenditures no longer representing assets of tangible value.....	\$17, 090, 822. 93
(b) Additional depreciation on Canal locks.....	14, 499, 200. 52
(c) Provide economic valuation reserve for surplus U. S.-rate quarters built during the war period but temporarily retained in use.....	4, 389, 830. 96
(d) Provide economic valuation reserve for Balboa Dry Dock (representing residual value of Balboa Dry Dock for transfer to defense and excess plant).....	2, 681, 006. 34

During the past year a firm of public accountants was employed by the Panama Railroad Company in a consulting capacity to advise on capital values of assets. It made a review of the historical record of Panama Canal assets and recommended certain major adjustments to provide a reasonable basis for transferring the assets to the Panama Canal Company. As a result of the review made to date, it appears desirable for the Panama Canal Company to make a further study, including a physical inventory and appraisal of all its assets. As proposed and approved by the Board of Directors of the Company, this appraisal will take several years and will indicate additional adjustments in the stated capital value for transfer to the Panama Canal Company.

In addition to the many adjustments in capitalization and depreciation, numerous principles involved in changing from the accounting for the Panama Canal to that of accounting for the Panama Canal Company were reviewed. Essentially, the accounting of the Panama Canal has been carried out in conformance with regulations and requirements for control over governmental funds and appropriations. These have been adapted to the extent possible to commercial accounting principles in order that the Panama Canal could produce operating statements comparable to those used by commercial concerns. There are, however, many features of Government fund accounting which are dissimilar to those used in commercial accounting, and the necessary changes to be effective July 1, 1951, were planned to the extent possible.

Accounts for fiscal year 1951 were closed and operating statements were compiled according to the concepts followed by the Panama Canal. Post-closing adjustments will be reflected in the first report of the Panama Canal Company. Examples of the post-closing adjustments to be made in the Panama Canal accounts are as follows: Establish full estimated value of leave liability due all employees

of the Company (Panama Canal accounts had reflected funds reserved for leave for employees in only those cases where full value of an employee's service was included in the stated cost of a construction or repair job); establish inventory reserves against certain stock items to assure against the Company's taking over inventories which might become obsolete, and which accordingly would not be purchased by a new organization at stated inventory prices; provide a reserve for deferred maintenance to be accomplished during future overhauls of the locks.

OPERATIONS OF THE PANAMA RAILROAD COMPANY

The results from the operations of the Panama Railroad Company's various business units on the Isthmus are shown in detail in the accounts of the Panama Railroad Company. The detailed statement of revenues, expenses, and statistics for all railroad industries, changes in the capital account, and the results from operations of the steamship line appear in the annual report of the Panama Railroad Company. A review of these activities is presented in section II of this report under the heading "Business operations under the Panama Railroad Company."

PANAMA CANAL OPERATIONS

The major financial results of Panama Canal operations are presented hereinafter in tables Nos. 1 to 28, with supplementary comments and explanations. Data on Canal traffic and other features of Canal operation are found in tables Nos. 29 to 49.

The complete report for the Finance Bureau, including tables and reports not printed herein because they are concerned principally with details of operations which lack general interest, is on file at the office of the Governor and at the Washington office of the Panama Canal.

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TABLE No. 1.—*Comparative balance sheet*

ASSETS

	June 30, 1951	June 30, 1950
Current assets:		
Cash (table No. 2).....	\$11,452,049.24	\$15,702,354.52
Accounts receivable (table No. 3).....	2,198,516.79	1,524,276.68
Materials and supplies (table No. 4).....	11,085,795.37	10,442,482.28
Work in progress (table No. 5).....	16,505.49	69,009.42
Total current assets.....	24,752,866.89	27,738,122.90
Deferred debits (table No. 6).....	92,978.94	112,818.05
Custodial funds (per contra) (table No. 7).....	11,178,721.33	12,847,535.71
Postal operating funds and 1952 license fees (table No. 7).....	560,864.83	
Capital assets:		
Depreciable assets:		
Buildings and structures (general) (table No. 8).....	105,992,069.06	114,413,405.11
Floating plant (table No. 9).....	15,218,489.78	14,180,679.08
Business operations structures (table No. 10).....	51,928,642.55	53,930,726.31
Business operations equipment (table No. 11).....	4,759,330.27	6,774,854.57
Total depreciable assets.....	177,898,531.66	189,299,665.07
Less: Accrued depreciation (table No. 12).....	89,739,923.43	61,163,080.62
Net depreciable assets.....	88,158,608.23	128,136,584.45
Nondepreciable assets (table No. 13).....	399,024,829.81	396,895,146.02
Subtotal.....	487,183,438.04	525,031,730.47
Special item projects.....	51,587,629.47	67,512,810.90
Additional facilities.....	69,992,218.94	70,417,571.30
Defense and excess plant.....	7,945,333.20	
Total capital assets.....	616,708,619.65	662,962,142.67
Total.....	653,294,051.64	703,660,649.33

LIABILITIES

Current liabilities:		
Accounts payable (table No. 14).....	\$3,184,313.75	\$4,390,964.22
Profits of business operations (table No. 15).....	(3,697,215.35)	667,219.19
Unliquidated obligations (table No. 16).....	232,966.84	1,816,003.83
Total current liabilities.....	(279,934.76)	6,874,187.24
Deferred credits (table No. 17).....	145,808.73	211,659.96
Custodial funds (per contra).....	11,178,721.33	12,847,535.71
Total liabilities.....	11,044,595.30	19,933,382.91

EQUITY OF U. S. GOVERNMENT

Obligated balances—appropriated funds:		
For repairs: Floating plant and business operations equipment (table No. 18).....	\$517,055.80	\$576,368.34
For replacement: Floating and business operations plant (table No. 19).....	9,220,684.15	5,757,199.53
For accrued leave (table No. 20).....	778,407.83	816,240.22
For current operations and incomplete construction.....	5,005,695.32	3,517,815.39
For postal operations.....	18,993.59	97,500.27
Total obligated balances—appropriated funds.....	15,540,836.69	10,765,123.75
Capital investment:		
Net capital investment (tables 8 to 13).....	487,183,438.04	525,031,730.47
Working capital (table No. 21).....	10,000,000.00	10,000,000.00
Subtotal.....	497,183,438.04	535,031,730.47
Special item projects, additional facilities, and defense and excess plant.....	129,525,181.61	137,930,412.20
Total capital investment (table No. 22).....	626,708,619.65	672,962,142.67
Total.....	653,294,051.64	703,660,649.33

The foregoing balance sheet conforms closely to the generally accepted presentation of corporate balance sheets. This balance sheet presents the equity of the United States Government, consisting of the capital investment, including working capital, and the obligated balances of appropriated funds. The equivalent of the item captioned "Balance, Revenues and Refundments" on the balance sheet in prior years is reflected in the accounts mentioned above as well as in the current liabilities and custodial funds contra account.

The statutes require that receipts for tolls, civil revenues, and net profits on business operations shall be covered into the United States Treasury and relinquished from control of the Panama Canal. Funds for current operating expenses and capital construction are appropriated by the Congress, and for comparative purposes are considered as provided from the tolls and other receipts covered into the Treasury. Practically all receipts other than those cited above are repayable to Canal appropriations and may be reexpended, but as the Canal is deprived of tolls revenue, its principal source of income, the reexpendable receipts are insufficient to provide for operation and maintenance, thus requiring the Canal to submit its expenditure program annually to the Congress.

These various fund requirements leave the Panama Canal balance sheet without an equivalent for the usual corporate "Surplus Account," since any surplus is included in the tolls covered into the Treasury by law. However, the equivalent for "Surplus Account" is shown on Table No. 24, which compares "Net Revenues" of \$272,964,017.93, representing the accumulated operating earnings of the Panama Canal before capital interest charges, with the computed interest on the net capital investment, by fiscal years, beginning with 1921, but no interest charge against the Canal is actually made by the United States Treasury.

TABLE No. 2.—Appropriated funds, receipts, and disbursements, fiscal year ended June 30, 1951

ACCOUNTABLE BALANCE JULY 1, 1950, BY APPROPRIATIONS AND FUNDS					
	Disbursing Clerk, Washington, D. C.	Treasurer, Canal Zone	Collecting agents, Canal Zone	Total	U. S. Treasury
					Total
Maintenance and operation, Panama Canal.....	\$761,078.81	\$3,715,896.45	\$14,647.44	\$4,491,622.70	\$8,934,451.79
Sanitation, Canal Zone, Panama Canal.....	34,220.08	531,544.00	3,432.25	569,196.33	224,415.70
Civil government, Panama Canal and Canal Zone.....	7,846.73	159,506.97	3,840.65	157,784.35	400,487.41
Postal funds, Canal Zone (special funds).....	11,897.52	128,176.95	4,694.16	144,768.63	386,575.01
Reparation of unemployed aliens, Panama Canal.....	-----	-----	-----	10,104.14	-----
Memorial to Maj. Gen. George W. Goethals.....	-----	-----	-----	-----	156,508.58
Construction, additional facilities, Panama Canal.....	21,182.89	185,583.44	-----	176,766.33	50,603.55
Total.....	836,226.03	4,690,901.95	23,114.50	5,550,242.48	10,152,112.04
APPROPRIATIONS, FISCAL YEAR 1951					
Maintenance and operation, Panama Canal.....	-----	-----	-----	-----	14,761,700.00
Sanitation, Canal Zone, Panama Canal.....	-----	-----	-----	-----	3,390,000.00
Civil Government, Panama Canal and Canal Zone.....	-----	-----	-----	-----	3,849,000.00
Total.....	-----	-----	-----	-----	22,000,700.00
TRANSFERS BETWEEN FISCAL OFFICERS					
Maintenance and operation, Panama Canal.....	9,000,000.00	17,301,672.52	-----	26,301,672.52	26,322,655.15
Sanitation, Canal Zone, Panama Canal.....	310,000.00	3,435,437.31	-----	3,745,437.31	3,782,686.05
Civil government, Panama Canal and Canal Zone.....	150,000.00	4,114,686.44	-----	4,264,686.44	4,264,686.44
Postal funds, Canal Zone (special fund).....	-----	328,645.17	-----	328,645.17	606,479.44
Memorial to Maj. Gen. George W. Goethals.....	-----	156,508.58	-----	156,508.58	156,508.58
Construction, additional facilities, Panama Canal.....	-----	51,023.55	-----	51,023.55	51,383.55
Total.....	9,460,000.00	25,387,973.57	-----	34,847,973.57	35,184,399.21
COLLECTIONS PAYABLE TO APPROPRIATIONS					
Maintenance and operation, Panama Canal.....	330,468.42	17,515,780.72	71,158.09	17,917,407.23	17,923,100.89
Sanitation, Canal Zone, Panama Canal.....	195,248.16	1,457,136.97	47,111.14	1,699,496.27	1,699,496.27
Civil government, Panama Canal and Canal Zone.....	2,241.50	433,733.25	15,345.09	451,319.84	451,319.84
Postal funds, Canal Zone (special fund).....	4,125.00	197,397.49	23,951.01	225,443.50	225,443.50
Construction, additional facilities, Panama Canal.....	2,007.34	18.81	-----	2,026.15	2,026.15
Total.....	534,090.42	19,604,037.24	157,565.33	20,295,692.99	20,301,386.65
Total to be accounted for.....	10,830,316.45	49,682,912.76	180,679.83	60,693,909.04	93,188,840.38

TABLE No. 2.—*Appropriated funds, receipts, and disbursements, fiscal year ended June 30, 1951*—Continued

COVERED INTO THE U. S. TREASURY					
Business net revenues, fiscal year 1950, maintenance and operation, Panama Canal					
		\$667, 219. 19			\$667, 219. 19
TRANSFERS BETWEEN FISCAL OFFICERS					
Maintenance and operation, Panama Canal					
Sanitation, Canal Zone, Panama Canal	\$20, 982. 63	2, 500, 000. 00	\$78, 889. 49	\$23, 722, 783. 03	20, 322, 555. 15
Civil government, Panama Canal and Canal Zone	37, 248. 74	50, 000. 00	43, 772. 87	131, 021. 61	3, 782, 086. 05
Postal funds, Canal Zone (special fund)			15, 189. 03	4, 249, 497. 41	4, 264, 086. 44
Memorial to Maj. Gen. George W. Goethals	4, 125. 00	273, 709. 27	28, 645. 17	300, 000. 00	606, 479. 44
Construction, additional facilities, Panama Canal	360. 00			156, 508. 58	156, 508. 58
Total	62, 716. 37	2, 823, 709. 27	166, 496. 56	32, 131, 477. 01	51, 383. 55
TRANSFERRED TO CUSTODIAL FUNDS (TABLE 7) ¹					
Postal funds, Canal Zone (special funds)	8, 195. 81	60, 901. 23		363, 409. 28	432, 506. 32
DISBURSEMENTS					
Maintenance and operation, Panama Canal					
Sanitation, Canal Zone, Panama Canal	9, 485, 882. 09	25, 010, 518. 00		45. 05	35, 396, 445. 14
Civil government, Panama Canal and Canal Zone	460, 203. 62	4, 780, 891. 27			5, 241, 094. 89
Postal funds, Canal Zone (special funds)	141, 067. 54	4, 307, 017. 12			4, 448, 084. 66
Repatriation of unemployed aliens, Panama Canal	3, 701. 71	319, 579. 11			323, 280. 82
Construction, additional facilities, Panama Canal		10, 104. 14			10, 104. 14
Total	3, 307. 55	30, 349. 22			33, 656. 77
	10, 094, 162. 51	35, 358, 458. 86		45. 05	45, 452, 666. 42
ACCOUNTABLE BALANCE JUNE 30, 1951					
Maintenance and operation, Panama Canal					
Sanitation, Canal Zone, Panama Canal	584, 682. 51	9, 455, 612. 50	6, 916. 04	10, 047, 211. 05	10, 047, 211. 05
Civil government, Panama Canal and Canal Zone	42, 015. 88	593, 257. 01	6, 770. 52	642, 013. 41	642, 013. 41
Memorial to Maj. Gen. George W. Goethals	19, 020. 69	390, 969. 54	496. 71	410, 516. 94	410, 516. 94
Construction, additional facilities, Panama Canal		156, 508. 58		156, 508. 58	156, 508. 58
Total	19, 522. 68	176, 276. 58		196, 799. 26	196, 799. 26
	665, 241. 76	10, 772, 624. 21	14, 183. 27	11, 452, 049. 24	211, 452, 049. 24
Total accounted for	10, 830, 316. 45	49, 682, 912. 76	180, 679. 83	32, 494, 931. 34	93, 188, 840. 38

¹ Postal funds transferred from appropriation to special funds (custodial) status effective November 1951 accounts in compliance with Comptroller General decision A-48650, Nov. 11, 1950.

² Balances in U. S. Treasury withdrawn by accountable fiscal officers in May 1951 accounts in compliance with accounting systems memorandum No. 15, Apr. 16, 1951.

TABLE NO. 3.—*Accounts receivable*
REGISTERED DURING THE YEAR

	Fiscal year 1951	Fiscal year 1950
Repaid to appropriations.....	\$15,539,546.57	\$16,141,566.70
Miscellaneous receipts:		
Tolls.....	23,960,266.92	24,513,126.36
Other.....	463.23	130.68
Total.....	23,960,730.15	24,513,257.04
Total accounts receivable registered.....	39,500,276.72	40,654,823.74
Number of bills registered.....	36,836	41,082

ACCOUNTS RECEIVABLE END OF FISCAL YEAR

Audited bills.....	\$2,133,070.74	\$1,419,916.73
Hospital certificates.....	42,272.79	45,355.98
Claims against carriers and contractors.....	3,564.67	1,039.05
Drums, carboys, reels, and cylinders returned for credit.....	2,855.50	1,975.50
Bills for rent and related charges.....	10,833.68	896.91
Payroll deductions.....		55,092.51
Bills for collection in hands of collecting agents.....	5,919.41	
Total.....	2,198,516.79	1,524,276.68

TABLE NO. 4.—*Materials and supplies*

	June 30, 1951	June 30, 1950
Stock on hand:		
General storehouses:		
Balboa:		
General.....	\$3,887,856.25	\$4,810,335.86
Medical.....	205,619.41	261,374.38
Cristobal.....	1,470,190.61	1,196,208.80
Oil-handling plants.....	1,920,509.34	672,789.48
Total storehouse stock.....	7,484,175.61	6,970,708.52
Other supplies and materials:		
Dredging division.....	1,201,518.70	1,028,760.09
Dredge pipelines.....	744,013.52	754,670.42
Locks division.....	702,841.47	697,201.93
Panama Canal Press.....		1,168,045.02
Gamboa gravel pile.....	102,823.50	114,084.36
Municipal work.....	234,686.09	201,194.37
Building division.....	180,339.39	151,872.47
Other.....	435,397.09	265,945.10
Total other supplies and materials.....	3,601,619.76	3,471,773.76
Book value, stock on hand.....	11,085,795.37	10,442,482.28
General storehouses stock transactions:		
Sales, issues, and transfers:		
Net issues.....	4,910,322.63	4,559,680.14
Net sales.....	1,289,073.84	1,708,241.18
Stock transfers.....	2,206,932.56	1,594,085.61
Total.....	6,406,329.03	7,862,006.93
Stock receipts:		
United States and local purchases.....	7,133,932.08	4,512,351.69
Local production.....	380,522.41	408,790.27
Total.....	7,514,454.49	4,921,141.96
Net change.....	1,108,125.46	(2,940,864.97)
Surveys and miscellaneous adjustments.....	(594,658.37)	(585,425.01)
Stock change during fiscal year.....	513,467.09	(3,526,289.98)

() Indicates reduction.

¹ Panama Canal Press transferred to Panama Railroad Company effective July 1, 1950.² Transfer of all spare parts for floating craft stocked for Navigation Division to Dredging Division at cost.

TABLE No. 5.—*Work in progress*

	June 30, 1951	June 30, 1950
Electrical division.....		\$210.96
Municipal division.....		358.41
Industrial bureau.....	\$24,850.71	57,710.96
Motor transportation division.....	1,924.04	1,037.09
Building division.....	(10,269.26)	
Panama Canal Press.....		9,691.97
Total work in progress.....	16,505.49	69,009.42

This account covers the amounts expended on uncompleted jobs, and will ultimately be cleared to operating expenses of the division indicated, with corresponding credits to their revenues after application of authorized charges to cover division overhead expenses.

TABLE No. 6.—*Deferred debits*

	Balance June 30, 1951	Balance June 30, 1950
Office engineering division.....		\$200.00
Port captain, Balboa.....		909.00
Aids to navigation subdivision.....		380.10
Dredging division.....		5,540.75
General accounts suspense.....	\$56,091.21	3,491.42
Water system.....		101.04
Municipal work.....		411.97
Building division.....	1,368.46	8,935.23
General storehouses.....	9,549.33	19,653.42
General storehouses, sundries suspense.....	14,440.74	15,140.49
Industrial bureau.....	11,179.20	47,327.69
Customs and immigration.....		63.20
Civil intelligence.....	350.00	
Gorgas Hospital.....		6,561.19
Colon Hospital.....		3,111.75
Corozal Hospital.....		986.40
Palo Seco Leprosarium.....		34.40
Total.....	92,978.94	112,848.05

This account covers expenses incurred for account of divisions indicated, but which are not chargeable to operating accounts of the current fiscal year. These amounts are cleared as soon as values are consumed.

TABLE No. 7.—*Custodial funds, receipts, and disbursements, fiscal year ended June 30, 1951*

	Disbursing clerk, Wash- ington, D. C.	Collecting agents, Isthmus	Treasurer, Canal Zone	Total	U. S. Treas- ury	Total
ACCOUNTABLE BALANCE, JULY 1, 1950						
Revenue due U. S. Treasury			\$14,348.25	\$14,348.25		\$14,348.25
Security deposits			1,704,689.17	1,724,844.17		1,724,844.17
Clubhouse funds	\$20,155.00		1,275,496.46	1,275,496.46		1,275,496.46
Money order and postal savings funds			9,572,736.03	9,572,736.03		9,572,736.03
Total	20,155.00		12,567,269.91	12,587,424.91		12,587,424.91
TRANSFERRED FROM APPROPRIATED FUNDS (TABLE 2) 1						
Postal operating funds	8,195.81		60,901.23	69,097.04	\$303,409.28	432,506.32
RECEIPTS						
Revenue due U. S. Treasury			23,984,542.69	23,988,637.20		23,988,637.20
Security deposits	2,534.01	\$1,560.50	35,755,302.69	35,906,300.95		35,906,300.95
Clubhouse funds	149,712.20	1,286.06	3,628,766.71	3,628,766.71		3,628,766.71
Money order and postal savings funds			5,286,312.07	5,286,312.07		5,286,312.07
Postal operating funds	6,600.00	25,295.04	484,630.20	516,525.24		516,525.24
Total	158,846.21	28,141.60	69,139,554.36	69,326,542.17		69,326,542.17
Total	187,197.02	28,141.60	81,767,725.50	81,983,064.12	363,409.28	82,346,473.40
TRANSFERS FROM U. S. TREASURY						
Postal operating funds			363,409.28	363,409.28	(363,409.28)	
Total to be accounted for	187,197.02	28,141.60	82,131,134.78	82,346,473.40		82,346,473.40
COVERED INTO U. S. TREASURY						
Revenue due U. S. Treasury	2,534.01		23,991,477.86	23,994,011.87		23,994,011.87

See footnote at end of table.

TABLE No. 7.—*Custodial funds, receipts, and disbursements, fiscal year ended June 30, 1951—Continued*

	Disbursing clerk, Wash- ington, D. C.	Collecting agents, Isthmus	Treasurer, Canal Zone	Total	U. S. Treas- ury	Total
TRANSFERS AND REFUNDS						
Security deposits.....	153,483.78	-----	35,677,484.39	35,830,968.17	-----	35,830,968.17
Money order and postal savings funds.....	-----	-----	7,018,385.50	7,018,385.50	-----	7,018,385.50
Postal operating funds.....	-----	21,082.00	-----	21,082.00	-----	21,082.00
Total.....	153,483.78	21,082.00	42,695,869.89	42,870,435.67	-----	42,870,435.67
DISBURSEMENTS						
Clubhouse funds.....	-----	-----	3,767,896.83	3,767,896.83	-----	3,767,896.83
Postal operating funds.....	5,350.12	-----	361,984.61	367,334.73	-----	367,334.73
Total.....	5,350.12	-----	4,129,881.44	4,135,231.56	-----	4,135,231.56
ACCOUNTABLE BALANCE, JUNE 30, 1951						
Revenue due U. S. Treasury.....	-----	21,560.50	7,413.08	8,973.58	-----	8,973.58
Security deposits.....	-----	1,286.06	1,782,507.47	1,800,176.95	-----	1,800,176.95
Clubhouse funds.....	16,383.42	-----	1,136,366.34	1,136,366.34	-----	1,136,366.34
Money order and postal savings funds.....	-----	-----	7,840,632.60	7,840,632.60	-----	7,840,632.60
Postal operating funds.....	9,445.69	4,213.04	546,956.10	560,614.83	-----	560,614.83
Total.....	25,829.11	7,059.60	11,313,905.59	11,346,794.30	-----	11,346,794.30
Total accounted for.....	187,197.02	28,141.60	82,131,134.78	82,346,473.40	-----	82,346,473.40

() Denotes reduction.

¹ Postal operating funds transferred from regular to special funds (custodial) status effective November 1950 accounts in compliance with Comptroller General decision No. A-48550, Nov. 11, 1950.

² Includes \$250 for hunting license fees for fiscal year 1952.

³ Includes \$5,950,000 invested in United States Treasury bonds; \$400,000 in United States savings bonds; and \$500,000 in United States Treasury notes, a total of \$6,850,000.

⁴ Total shown under custodial and postal funds on the balance sheet (table 1) in the amount of \$11,739,586.16 differs from the balance shown above by \$392,791.86, which represents outstanding bills in process of collection.

Custodial funds cover cash transactions which are controlled by separate fiscal regulations from those which govern the expenditure of appropriations made by Congress for maintenance and operation of the Panama Canal.

Revenue due United States Treasury covers collections for deposit as miscellaneous receipts of the United States Government which form no part of the working cash of the Panama Canal, as those funds must by law immediately be covered into the United States Treasury and relinquished from control of the Panama Canal. These collections consist mainly of tolls, licenses, and court fees and fines.

Security deposits cover cash received by Canal fiscal officers from banks, individuals, and companies to guarantee payment of bills rendered by the Panama Canal and the Panama Railroad Company, and to guarantee fulfillment of contracts. Disbursements of these funds represent transfers to Revenue due United States Treasury on this table, collections repayable to appropriations on table No. 2, and the return of unexpended balances to depositors.

Special deposit funds cover certain activities conducted by the Canal Zone government separately from appropriations, principally postal money order funds, and transactions of Panama Canal club-houses maintained exclusively for employees.

TABLE NO. 8.—*Depreciable assets, buildings, and structures (general) fiscal year 1951*

	Balance July 1, 1950	Additions and transfers	Retirements and transfers	Balance June 30, 1951
Locks:				
Miraflores.....	\$19,323,930.84		\$37,980.16	\$19,285,950.68
Pedro Miguel.....	14,587,454.77			14,587,454.77
Gatun.....	31,256,527.93	\$46,771.83	154.36	31,303,145.40
Floating caisson.....	997,868.15			997,868.15
Towing locomotives.....	2,126,085.62	24,522.61		2,150,608.23
Telephone system.....		294,099.95		294,099.95
Total locks.....	68,291,867.31	365,394.39	38,134.52	68,619,127.18
Dams: Madden.....	5,508,509.79			5,508,509.79
Spillways:				
Miraflores.....	938,564.43			938,564.43
Gatun.....	2,853,004.90			2,853,004.90
Total spillways.....	3,791,569.33			3,791,569.33
Aids to navigation:				
Channel aids.....	635,534.17			635,534.17
Transit aids.....	24,191.04			24,191.04
Coastal aids.....	175,069.78		36,376.18	138,693.60
Lighthouse depot, Gatun.....	204,061.81			204,061.81
Total aids to navigation.....	1,038,856.80		36,376.18	1,002,480.62
Wharves and piers:				
Balboa.....	4,885,100.45		1,406,049.95	3,479,050.50
Gamboa.....	295,430.46			295,430.46
Cristobal.....	3,841,254.87		2,546,743.29	1,294,511.58
Total wharves and piers.....	9,021,785.78		3,952,793.24	5,068,992.54

TABLE NO. 8.—*Depreciable assets, buildings, and structures (general) fiscal year 1951—Continued*

	Balance July 1, 1950	Additions and transfers	Retirements and transfers	Balance June 30, 1951
Dry docks:				
Balboa.....	\$2, 993, 202. 79	\$15, 535. 01	\$3, 008, 737. 80	-----
Cristobal.....	602, 268. 80	91, 351. 37	-----	\$693, 620. 17
Total dry docks.....	3, 595, 471. 59	106, 886. 38	3, 008, 737. 80	693, 620. 17
Coaling plants:				
Balboa.....	1, 181, 614. 65	-----	1, 181, 614. 65	-----
Cristobal.....	3, 276, 620. 75	-----	3, 276, 620. 75	-----
Total coaling plants.....	4, 458, 235. 40	-----	4, 458, 235. 40	-----
Dredging division plant.....	1, 202, 413. 46	340, 658. 30	15, 281. 52	1, 527, 790. 24
Ferry plants.....	1, 199, 024. 24	-----	-----	1, 199, 024. 24
Miraflores bridge.....	1, 454, 970. 86	379, 890. 11	-----	1, 834, 860. 97
General buildings and structures:				
Office buildings.....	2, 259, 263. 89	-----	829, 915. 09	1, 429, 348. 80
Other buildings and structures.....	498, 207. 12	187, 906. 24	248, 694. 39	437, 418. 97
Total other buildings and structures.....	2, 757, 471. 01	187, 906. 24	1, 078, 609. 48	1, 866, 767. 77
Health bureau buildings and structures:				
Gorgas Hospital.....	4, 168, 149. 76	93, 055. 81	85, 935. 10	4, 175, 270. 47
Colon Hospital.....	720, 841. 92	-----	-----	720, 841. 92
Margarita Hospital.....	401, 196. 46	524, 639. 03	-----	925, 835. 49
Corozal Hospital.....	810, 986. 76	-----	-----	810, 986. 76
Palo Seco Leprosarium.....	228, 395. 73	-----	12, 555. 49	215, 840. 24
Dispensaries.....	387, 799. 13	60, 807. 90	-----	448, 607. 03
Quarantine station.....	65, 933. 65	-----	65, 933. 65	-----
Other buildings and structures.....	117, 190. 93	8, 759. 10	-----	125, 950. 03
Total health bureau buildings and structures.....	6, 900, 494. 34	687, 261. 84	164, 424. 24	7, 423, 331. 94
Civic buildings and structures:				
Schoolhouses.....	3, 761, 172. 76	267, 624. 99	2, 366. 86	4, 026, 430. 89
Recreational structures.....	486, 387. 19	747, 474. 52	960. 97	1, 232, 900. 74
Police stations.....	284, 387. 98	34, 480. 37	-----	318, 868. 35
Prisons.....	85, 069. 74	7, 248. 70	-----	92, 318. 44
Fire stations.....	121, 749. 77	42, 884. 57	-----	164, 634. 34
Courthouses.....	187, 732. 73	-----	-----	187, 732. 73
Post offices.....	227, 452. 72	117, 283. 56	-----	344, 736. 28
Other buildings and structures.....	38, 782. 31	1, 088, 372. 50	38, 782. 31	1, 088, 372. 50
Total civic buildings and structures.....	5, 192, 735. 20	2, 305, 369. 21	42, 110. 14	7, 455, 994. 27
Total depreciable assets, buildings and structures (general).....	114, 413, 405. 11	4, 373, 366. 47	12, 794, 702. 52	105, 992, 069. 06

TABLE NO. 9.—*Depreciable assets, floating plant, fiscal year 1951*

	Balance July 1, 1950	Additions and transfers	Retirements and transfers	Balance June 30, 1951
Tugs and crane boats.....	\$5, 681, 194. 24	\$189, 455. 15	-----	\$5, 870, 649. 39
Launches.....	987, 015. 67	46, 295. 23	\$9, 248. 00	1, 024, 062. 90
Dredges.....	4, 129, 055. 07	397, 429. 04	-----	4, 526, 484. 11
Dump scows.....	1, 755, 301. 63	357, 099. 37	-----	2, 112, 401. 00
Machine barges.....	1, 091, 686. 30	-----	-----	1, 091, 686. 30
Lighters.....	458, 642. 96	52, 261. 24	-----	510, 904. 20
Launch repair barge.....	27, 763. 78	-----	-----	27, 763. 78
Anchor barges.....	50, 019. 43	4, 518. 67	-----	54, 538. 10
Total.....	14, 180, 679. 08	1, 047, 058. 70	9, 248. 00	15, 218, 489. 78

TABLE NO. 10.—*Depreciable assets, business operations, structures, fiscal year 1951*

	Balance July 1, 1950	Additions and Transfers	Retirements and Transfers	Balance June 30, 1951
Electric power system:				
Hydroelectric plants:				
Gatun.....	\$2,456,294.72			\$2,456,294.72
Madden Dam.....	1,728,152.54			1,728,152.54
Diesel electric plant, Miraflores.....	1,969,232.85			1,969,232.85
Substations.....	2,086,843.49	\$102,268.69	\$46,272.57	2,142,839.61
Transmission lines.....	1,560,695.81			1,560,695.81
Distribution system.....	2,496,055.11	523,808.96	12,096.56	3,007,767.51
Total, electric power system.....	12,297,274.52	626,077.65	58,369.13	12,864,983.04
Electrical work.....	396,207.35		52,385.75	343,821.60
Telephone system.....		58,957.77		58,957.77
Water system:				
Zone system.....	1,964,503.94	330,718.94	197,628.96	2,097,593.92
Zone-Panama system.....	3,951,055.44	11,337.15		3,962,392.59
Zone-Colon system.....	1,523,011.78	881.62		1,523,893.40
Total, water system.....	7,438,571.16	342,937.71	197,628.96	7,583,879.91
Municipal engineering work.....	159,988.34		5,200.00	154,788.34
Industrial bureau:				
Balboa shops.....	2,770,035.29		2,464,855.87	305,179.42
Cristobal shops.....	690,021.91			690,021.91
Total, industrial bureau.....	3,460,057.20		2,464,855.87	995,201.33
Oil-handling plants:				
Balboa.....	1,543,827.75		1,543,827.75	
Cristobal.....	1,587,108.64		1,587,108.64	
Total, oil-handling plants.....	3,130,936.39		3,130,936.39	
General storehouses:				
Balboa.....	1,005,024.02	600,493.97	3,239.90	1,602,278.09
Corozal.....	14,022.53		14,022.53	
Summit.....	10,234.17			10,234.17
Cristobal.....	478,202.03	642,384.37		1,120,586.40
Total, general storehouses.....	1,507,482.75	1,242,878.34	17,262.43	2,733,098.66
Motor transportation division.....	446,106.65	44,574.83	11,822.58	478,858.90
Building division.....	168,152.74	10,027.05	5,472.24	172,707.55
U. S.-rate quarters.....	20,583,150.72	926,091.85	8,713,386.90	12,795,855.67
Surplus U. S.-rate quarters.....		8,207,733.63		8,207,733.63
Local-rate quarters.....	3,552,179.30	585,440.28	65,233.17	4,072,386.41
Gasoline service stations.....	63,901.97		63,901.97	
Clubhouse business structures.....	726,717.22	876,470.65	149,274.02	1,453,913.85
Summit nursery plant.....		12,455.89		12,455.89
Total, depreciable assets, business operations structures.....	53,930,726.31	12,933,645.65	14,935,729.41	51,928,642.55

TABLE No. 11.—*Deprcciable assets, business operations equipment, fiscal year 1951*

	Balance July 1, 1950	Additions and transfers	Retirements and transfers	June 30, 1951
Electric power system.....	\$544,561.95	\$139,166.40	\$129,316.15	\$554,412.20
Electrical work.....	6,931.55	4,238.81	-----	11,170.36
Municipal work.....	217,964.53	99,996.34	31,839.59	286,121.28
Sosa Hill plant.....	81,895.31	30,667.27	6,800.00	105,762.58
Industrial bureau.....	2,516,265.79	155,636.66	1,520,031.20	1,151,871.25
General storehouses.....	172,398.91	5,063.73	23,281.13	154,181.51
Motor transportation.....	1,583,247.40	323,801.79	139,146.91	1,767,902.28
Building division.....	201,681.57	2,777.25	60,135.82	144,323.00
Panama Canal Press.....	141,608.46	-----	141,608.46	-----
U. S.-rates quarters—furniture.....	1,308,299.10	-----	724,713.29	583,585.81
Total, business equipment.....	6,774,854.57	761,348.25	2,776,872.55	4,759,330.27

TABLE No. 12.—*Accrued depreciation fiscal year 1951*

CANAL DEPRECIATION

	Balance July 1, 1950	Accruals	Adjustments, retirements, and transfers	Balance June 30, 1951
Locks.....	\$17,221,036.94	\$532,358.87	(\$14,502,745.35)	\$32,256,141.16
Dams.....	825,335.38	55,085.09	(112,568.88)	992,989.35
Spillways.....	746,218.20	21,320.52	(767,538.72)	1,535,077.44
Aids to navigation.....	536,395.51	17,419.05	25,462.80	528,351.76
Wharves and piers.....	4,017,783.18	112,280.02	2,326,338.85	1,803,724.35
Dry docks.....	1,242,512.14	42,657.93	1,146,774.02	138,396.05
Coaling plants.....	3,391,107.22	-----	3,391,107.22	-----
Dredging division plant.....	842,412.67	48,449.39	(325,931.58)	1,216,793.64
Ferry plants.....	514,824.24	66,680.97	-----	581,505.21
Miraflores Bridge.....	44,090.03	44,090.03	(324,663.69)	412,843.75
Office buildings.....	698,549.17	16,450.74	190,708.60	524,291.31
Other general buildings and structures.....	289,870.40	4,150.42	26,181.04	267,839.78
Gorgas Hospital.....	625,834.77	48,652.32	16,508.25	657,978.84
Colon Hospital.....	180,821.67	15,224.86	-----	196,046.53
Margarita Hospital.....	49,878.47	9,758.83	(146,899.00)	206,536.30
Corozal Hospital.....	197,223.78	13,592.89	-----	210,816.67
Palo Seco Leprosarium.....	74,026.68	6,135.85	12,555.49	67,607.04
Dispensaries.....	108,302.26	7,399.11	(24,254.00)	139,955.37
Quarantine stations.....	65,392.70	-----	65,392.70	-----
Other health department structures.....	46,508.75	2,808.00	(3,432.00)	52,748.75
Schoolhouses.....	570,243.09	61,206.96	(94,768.96)	726,219.01
Recreational structures.....	141,805.35	11,927.98	(219,026.36)	372,759.69
Police stations.....	77,539.56	6,262.05	(12,414.00)	96,215.61
Prisons.....	23,935.37	2,983.09	-----	26,918.46
Fire stations.....	57,244.27	2,541.34	(17,156.00)	76,941.61
Courthouses.....	126,209.15	3,754.65	-----	129,963.80
Post offices.....	29,237.28	2,526.68	(44,261.00)	76,024.96
Other civic buildings and structures.....	29,263.09	13,280.87	(248,365.94)	290,909.90
Contingent reserve.....	694,404.14	331,001.49	87,524.41	937,881.22
Total, Canal depreciation.....	33,468,005.46	1,500,000.00	1 (9,555,472.10)	44,523,477.56

() Indicates increase.

1 Represents principally adjustment in depreciation of locks, dams, and spillways, and also transfers from third locks and special item projects.

TABLE No. 12.—*Accrued depreciation fiscal year 1951—Continued*

PLANT DEPRECIATION

	Balance July 1, 1950	Accruals	Adjustments, retirements, and transfers	Balance June 30, 1951
Floating plant:				
Tugs and crane boats.....	\$1,622,770.33	\$225,128.44	(\$134,661.59)	\$1,982,560.36
Launches.....	559,829.02	68,238.81	(37,047.23)	665,115.09
Dredges.....	2,487,671.94	129,621.20	(397,429.04)	3,014,722.18
Dump scows.....	850,609.60	73,119.34	(357,099.37)	1,280,828.31
Machine barges.....	633,923.26	48,564.00	-----	682,487.26
Lighters.....	246,746.36	19,626.00	(52,261.24)	318,633.60
Launch repair barges.....	10,440.00	1,392.00	-----	11,832.00
Anchor barges.....	12,402.00	2,496.00	(4,518.67)	19,416.67
Total, floating plant.....	6,424,392.51	568,185.82	(983,017.14)	7,975,595.47
Business operations structures:				
Electric power system.....	3,820,855.80	239,072.45	(1,084,563.98)	5,144,492.23
Electrical work.....	128,706.91	9,933.36	23,463.65	115,176.62
Telephone system.....	-----	-----	(12,834.42)	12,834.42
Water system.....	2,310,973.67	175,704.00	(600,159.51)	3,086,837.18
Municipal work.....	53,680.82	3,514.80	4,118.00	53,077.62
Industrial bureau.....	1,491,121.90	30,514.41	1,167,343.76	354,292.55
Oil-handling plants.....	1,557,180.35	-----	1,557,180.35	-----
General storehouses.....	836,080.31	85,734.72	(587,219.08)	1,509,034.11
Motor transportation division.....	135,629.21	13,548.62	(3,703.42)	152,881.25
Building division.....	32,059.14	5,020.27	5,322.24	31,757.17
U. S.-rate quarters.....	4,973,826.71	544,192.77	34,009.20	5,484,010.28
Surplus U. S.-rate quarters.....	-----	-----	(2,728,816.00)	2,728,816.00
Local-rate quarters.....	977,222.24	130,553.73	(256,369.80)	1,364,145.77
Clubhouse business structures.....	350,162.34	13,504.32	(176,294.84)	539,961.50
Gasoline service stations.....	29,357.15	-----	29,357.15	-----
Total, business operations structures.....	16,696,856.55	1,251,293.45	(2,629,166.70)	20,577,316.70
Business operations equipment:				
Electric power system.....	284,661.49	31,309.46	134,545.53	181,425.42
Electrical work.....	6,467.57	406.02	(2,343.33)	9,216.92
Municipal work.....	173,157.15	19,278.11	(11,477.81)	203,913.07
Sosa Hill plant.....	68,151.14	4,344.00	(23,867.27)	96,362.41
Industrial bureau.....	1,587,049.74	55,827.17	930,167.19	712,709.72
General storehouses.....	118,009.04	8,977.31	16,321.92	110,664.43
Motor transportation division.....	998,197.43	154,978.65	139,146.91	1,014,029.17
Building division.....	132,063.84	6,348.08	37,632.29	100,779.63
Panama Canal Press.....	105,098.13	-----	105,098.13	-----
U. S.-rate quarters—furniture.....	1,100,970.57	82,759.98	724,713.29	459,017.26
Total, business operations equipment.....	4,573,826.10	364,228.78	2,049,936.85	2,888,118.03
Total, plant depreciation.....	27,695,075.16	2,183,708.05	(1,562,246.99)	31,441,030.20

() Denotes increase.

SUMMARY

Canal depreciation.....	\$33,468,005.46	\$1,500,000.00	(\$9,555,472.10)	\$44,523,477.56
Plant depreciation.....	27,695,075.16	2,183,708.05	(1,562,246.99)	31,441,030.20
Total.....	61,163,080.62	3,683,708.05	(11,117,719.09)	75,964,507.76
Defense and excess plant depreciation.....	-----	3,272,365.40	-----	3,272,365.40
Economic valuation reserve.....	-----	10,503,050.27	-----	10,503,050.27
Total.....	61,163,080.62	17,459,123.72	(11,117,719.09)	89,739,923.43

() Denotes increase.

The total accrued balance under Canal and plant depreciation amounting to \$75,964,507.76 and economic valuation reserves amounting to \$10,503,050.27, applies to depreciable capital assets shown on tables Nos. 8, 9, 10, and 11, amounting to \$177,898,531.66. Depreciation on defense and excess plant applies to defense and excess capital in the amount of \$7,945,333.20 shown on table No. 1.

TABLE NO. 13.—*Nondepreciable assets, fiscal year 1951*

	Balance July 1, 1950	Additions and transfers	Retirements and transfers	Balance June 30, 1951
LAND—EXCAVATION, FILL AND IMPROVEMENTS				
Channels, harbors, and basins:				
Balboa to Pedro Miguel	\$24,309,928.86			\$24,309,928.86
Pedro Miguel to Gatun	113,466,691.77			113,466,691.77
Gatun to Cristobal	12,829,445.51			12,829,445.51
Breakwaters:				
Naos Island	1,075,874.10			1,075,874.10
Colon—East	3,994,727.10			3,994,727.10
Colon—West	4,528,829.57			4,528,829.57
Canal locks, excavation, fill, etc.:				
Miraflores	5,527,675.15			5,527,675.15
Pedro Miguel	2,505,335.52			2,505,335.52
Gatun	7,243,221.62			7,243,221.62
Dams:				
Miraflores	1,228,561.63			1,228,561.63
Pedro Miguel	457,302.32			457,302.32
Madden	4,568,060.82			4,568,060.82
Gatun	10,475,943.56			10,475,943.56
Mindi Levec—Gatun	148,974.22			148,974.22
Spillways:				
Miraflores	460,120.51			460,120.51
Gatun	1,470,533.12			1,470,533.12
Dry docks, excavation, fill, etc.:				
Balboa	826,342.82		\$826,342.82	
Cristobal	152,078.72			152,078.72
Permanent townsites	2,912,783.52	\$1,296,031.59	50,824.07	4,157,991.04
Roads, streets, and sidewalks	8,583,149.68	910,142.20	24,760.86	9,468,531.02
Sewer system	1,178,899.34	771,250.74	9,262.67	1,940,887.41
Street-light system	367,020.91	66,700.95	3,251.27	430,470.59
	208,311,500.37	3,044,125.48	914,441.69	210,441,184.16
TITLES AND TREATY RIGHTS				
Purchase price, new Panama Canal Company	131,717,335.97			31,717,335.97
Treaty payment to Republic of Panama, 1904	10,000,000.00			10,000,000.00
Annual treaty payments to Republic of Panama, 1913-20	2,000,000.00			2,000,000.00
Relocation of Panama Railroad	9,800,626.46			9,800,626.46
Re-equipment of Panama Railroad	3,247,332.11			3,247,332.11
Depopulation, Canal Zone	2,827,288.11			2,827,288.11
Subtotal	59,592,582.65			59,592,582.65
Interest during construction	128,991,063.00			128,991,063.00
Grand total, nondepreciable property	396,895,146.02	3,044,125.48	914,441.69	399,024,829.81

¹ Original purchase price of \$40,000,000 less Panama Railroad Company capital stock and sales and transfers of property acquired.

Channels, harbors, basins, breakwaters, and municipal assets are maintained at original values from current operating expenses. Other nondepreciable property includes excavation and earth fills at locks, dams, and dry docks, and earth saddles at Madden Dam; also certain projects which were incomplete at the close of the fiscal year.

TABLE NO. 14.—*Accounts payable*

	June 30, 1951	June 30, 1950
United States and local suppliers	\$999,941.93	\$609,878.74
Transportation and procurement	635,908.74	1,521,044.60
Salaries and wages of employees	1,038,902.76	2,260,040.88
Taxes, F. I. C. A., etc., withheld from employees	509,560.32	
Total	3,184,313.75	4,390,964.22

The foregoing table covers all current obligations of the Panama Canal except deposits to guarantee payment of bills, and special deposit funds, which are covered by table No. 7, custodial funds; and unliquidated obligations, which are covered by table No. 16.

TABLE NO. 15.—*Business operations: Revenues, expenses, and profit or loss, fiscal year 1951*

	Revenues	Expenses	Profit or (loss)
Electric power system	\$1,541,166.88	\$1,239,808.81	\$301,358.07
Electrical work	1,785,171.20	1,778,313.17	6,858.03
Water system	1,164,168.24	1,010,248.94	153,919.30
Municipal work	2,277,224.28	2,186,461.68	90,759.60
Building division	3,133,464.29	3,103,206.52	30,257.77
U. S.-rate quarters	1,613,006.30	1,885,649.64	(272,643.34)
Local-rate quarters	552,297.59	576,236.66	(23,939.07)
Gamboa gravel plant	28,974.45	26,009.93	2,964.52
Supply and service bureau	42,562.79	42,562.79	—
Storehouses division	11,243,906.12	10,888,390.06	355,516.06
Motor transportation division	1,829,890.65	1,781,730.06	48,160.59
Industrial bureau	2,838,469.63	2,908,835.24	(70,365.61)
Omitted overtime claims	—	44,124.63	(44,124.63)
Rental, Hotel Tivoli	12.00	—	12.00
Proceeds from canceled pay receipts	59,134.04	—	59,134.04
Total	28,109,448.46	27,471,581.13	637,867.33
Prior fiscal years' revenue adjustments as follows:			
Add:			
Land grant refund collections			696,431.37
Net value of leave for employees transferred between Canal-Railroad organization			307.94
Total			1,334,606.64
Deduct:			
Residual value of certain Panama Railroad quarters			59,033.92
Short depreciation charged direct to business surplus:			
Electric power system			1,011,579.74
Water system			668,637.82
Municipal division			1,082.00
Quarters:			
U. S. rate			3,154,613.42
Local rate			133,547.09
Motor transportation division			3,328.00
Total			4,972,788.07
Total deficit, regular operations			3,697,215.35
Add:			
Provision for economic valuation reserve on excess plant:			
Electrical work			28,922.10
Water system			32,969.87
Storehouse division			6,742.40
Motor transportation division			14,628.46
Industrial bureau			1,898,639.93
Panama Canal clubhouses			219,366.30
Total economic valuation reserve			2,201,269.06
Grand total deficit			5,898,484.41

() Denotes deficit.

Business operations of the Panama Canal are conducted separately from operating activities pertaining directly to the transiting of vessels, and government of the Canal Zone. The annual appropriation acts for the Panama Canal authorize the use of appropriated funds for the conduct of auxiliary business activities, provided that funds so advanced are recovered through earnings, and with the further provision that any net profit derived from such business activities be covered annually into the United States Treasury.

TABLE NO. 16.—*Unliquidated obligations*

	June 30, 1951	June 30, 1950
Maintenance and operation:		
Assistant engineer of maintenance.....		\$117. 72
Pacific locks.....		723, 039. 38
Atlantic locks.....		192, 101. 55
Office engineer.....		897. 00
Meteorology and hydrography.....		1, 117. 00
Dredging division.....		7, 000. 00
Quartermaster operations.....		8, 796. 39
Personnel supervision and management.....		9, 191. 03
Administrative branch.....		3, 474. 13
Finance bureau.....	\$22, 000. 00	24, 815. 50
General accounts, suspense.....		307. 94
Recruiting employees.....	36, 281. 46	10, 105. 04
Repatriating employees.....	59, 559. 76	87, 672. 88
Damages to vessels.....	60, 000. 00	95, 404. 21
Electric power system.....		81, 837. 48
Electrical work.....		50, 232. 40
Water system.....		25. 00
Municipal work.....		13, 869. 79
General storehouses.....	333. 57	32, 081. 08
Industrial bureau.....		5, 981. 92
Building division.....		4, 843. 85
U. S.-rate quarters.....		21, 506. 49
Gasoline service stations.....		5, 380. 55
Total, maintenance and operation.....	178, 174. 79	1, 379, 798. 33
Sanitation:		
Chief health office.....		800. 00
Gorgas Hospital.....		172, 227. 88
Colon Hospital.....		5, 702. 37
Corozal Hospital.....		8, 429. 48
Palo Seco Leprosarium.....		453. 46
Veneral disease clinics.....		1, 850. 00
Dispensaries.....		4, 569. 01
Cemeteries.....		60. 80
Quarantine and immigration.....		860. 00
Sanitation.....		4, 000. 00
Recruiting employees.....	21, 845. 90	30, 211. 52
Repatriating employees.....	15, 894. 17	15, 153. 29
Total, sanitation.....	37, 710. 07	244, 317. 81
Civil government:		
Civil affairs division.....		1, 790. 82
Schools.....		20, 190. 72
Police and prisons.....		2, 237. 01
Fire section.....		16, 877. 90
Magistrates courts.....		210. 00
Recruiting employees.....	1, 805. 57	14, 994. 51
Repatriating employees.....	13, 470. 02	20, 663. 87
Total, civil government.....	15, 275. 59	76, 964. 83
Postal service: Repatriating employees.....	1, 806. 39	1, 995. 12
Construction, additional facilities.....		112, 927. 74
Total.....	232, 966. 84	1, 816, 003. 83

In anticipation of transfer to the Panama Canal Company, the Panama Canal discontinued during fiscal year 1951 its practice of obligating funds. The remaining balances in this account as of June 30, 1951, represent miscellaneous liabilities of the Panama Canal heretofore carried as "unliquidated obligations" for transfer to the Panama Canal Company and the Canal Zone government.

TABLE NO. 17.—*Deferred credits*

	June 30, 1951	June 30, 1950
Finance bureau.....	\$1, 335. 50	\$1, 331. 75
Navigation division.....	13, 247. 01	7, 580. 23
Marine Director's office.....	134. 79	-----
Engineering division.....	108. 00	-----
Community services.....	24, 791. 39	12, 729. 19
General accounts.....	50, 000. 00	-----
Building division.....	-----	206. 31
U. S.-rate quarters.....	6, 070. 70	5, 035. 70
Local-rate quarters.....	4, 219. 02	4, 044. 76
Storehouse division.....	15, 000. 00	-----
Storehouse sundries suspense.....	20, 103. 54	119, 200. 15
Industrial bureau.....	5, 136. 03	5, 136. 03
Contingencies, maintenance and operation.....	-----	55, 460. 01
Postal service.....	5, 412. 75	-----
Police.....	250. 00	-----
Contingencies civil government.....	-----	284. 90
Contingencies, sanitation.....	-----	650. 93
Total.....	145, 808. 73	211, 659. 96

This account covers income received which is applicable to the succeeding fiscal year.

TABLE NO. 18.—*Obligated balances—appropriated funds for repairs: Floating plant and business equipment, fiscal year 1951*

	Balance July 1, 1950	Accruals and adjust- ments	Charges	Balance June 30, 1951
Tugs and crane boats.....	\$140, 754. 94	\$123, 999. 80	\$161, 278. 28	\$103, 476. 46
Dredges.....	98, 726. 53	168, 000. 00	136, 483. 03	130, 243. 50
Dump scows.....	288, 450. 99	120, 240. 00	189, 742. 21	218, 948. 78
Machine barges.....	20, 857. 02	8, 700. 00	7, 272. 52	22, 284. 50
Lighters.....	8, 609. 79	10, 800. 00	4, 402. 40	15, 007. 39
Total, floating plant.....	557, 399. 27	431, 739. 80	499, 178. 44	489, 960. 63
Electrical work, equipment.....	18, 969. 07	95, 757. 79	87, 631. 69	27, 095. 17
Total, business equipment.....	18, 969. 07	95, 757. 79	87, 631. 69	27, 095. 17
Balance, appropriated funds, for repairs.....	576, 368. 34	527, 497. 59	586, 810. 13	517, 055. 80

TABLE NO. 19.—*Obligated balances—appropriated funds for replacement—business operations plant, fiscal year 1951*

	Balance July 1, 1950	Accruals	Expendi- tures	Balance June 30, 1951
Balance.....	\$6, 007, 199. 53	-----	-----	-----
Less:				
Credited to reserve for leave.....	250, 000. 00	-----	-----	-----
To reduce 1951 appropriation require- ment.....	1, 766, 435. 00	-----	-----	-----
	3, 990, 764. 53	-----	-----	-----
Electric power system.....	-----	\$1, 281, 961. 65	\$152, 166. 68	-----
Electrical work.....	-----	10, 339. 38	-----	-----
Water system.....	-----	844, 341. 82	8, 299. 38	-----
Municipal work.....	-----	28, 218. 91	36, 952. 66	-----
Building division.....	-----	11, 368. 35	-----	-----
Quarters:	-----	-----	-----	-----
U. S. rate.....	-----	3, 781, 566. 17	459, 166. 08	-----
Local rate.....	-----	264, 100. 82	226, 295. 43	-----
Storehouse division.....	-----	94, 712. 03	-----	-----
Motor transportation division.....	-----	171, 855. 27	323, 801. 79	-----
Industrial bureau.....	-----	86, 341. 58	151, 708. 66	-----
Clubhouse division.....	-----	13, 504. 32	-----	-----
Total.....	3, 990, 764. 53	6, 588, 310. 30	1, 358, 390. 68	\$9, 220, 684. 15

¹ Total accruals for the fiscal year 1951:

Depreciation expense, current operations (table 12).....	\$1, 615, 522. 23
Short depreciation charged direct to surplus (table 15).....	4, 972, 788. 07

Total..... 6, 588, 310. 30

TABLE NO. 20.—*Obligated balances—appropriated funds for accrued leave, fiscal year 1951*

	Balance July 1, 1950	Accruals	Charges	Balance June 30, 1951
Electrical division.....	\$190, 107. 34	\$160, 448. 85	\$182, 564. 72	\$167, 991. 47
Municipal division.....	145, 662. 47	173, 852. 30	183, 580. 59	135, 934. 18
Industrial bureau.....	203, 105. 00	284, 484. 50	290, 464. 26	197, 125. 24
Motor transportation division.....	103, 930. 90	135, 710. 68	129, 064. 35	110, 577. 23
Building division.....	100, 956. 72	200, 184. 12	217, 744. 33	83, 396. 51
Office engineering division.....	72, 477. 79	123, 004. 28	112, 098. 87	83, 383. 20
Total reserve for leave.....	\$16, 240. 22	1, 077, 684. 73	1, 115, 517. 12	778, 407. 83

The foregoing table represents the reserve for vacation pay due employees of the principal business divisions, and the funds obligated therefor. The reserve is credited by adding a percentage to direct labor charges for work performed by the divisions listed above to the credit of this account. The account is debited with the amount paid to employees when leave is actually taken.

TABLE NO. 21.—*Working capital*

ASSETS	
Cash (table No. 2).....	\$11, 452, 049. 24
Accounts receivable (table No. 3).....	2, 198, 516. 79
Materials and supplies (table No. 4).....	11, 085, 795. 37
Work in progress (table No. 5).....	16, 505. 49
Deferred debits (table No. 6).....	92, 978. 94
Postal funds (table No. 7).....	560, 614. 83
Total.....	25, 406, 460. 66
LIABILITIES	
Accounts payable (table No. 14).....	3, 184, 313. 75
Profits of business operations (table No. 15).....	(3, 638, 181. 43)
Unliquidated obligations (table No. 16).....	232, 966. 84
Deferred credits (table No. 17).....	145, 808. 73
Total.....	(75, 092. 11)
Net assets.....	25, 481, 552. 77
Add:	
Revenue due U. S. Treasury—hunting license fees, fiscal year 1952.....	250. 00
Residual value of certain Panama Railroad quarters.....	59, 033. 92
Total.....	25, 540, 836. 69
Deduct: Obligated balances—appropriated funds.....	15, 540, 836. 69
Working capital.....	10, 000, 000. 00

() Denotes deficit.

A revolving fund now fixed at \$10,000,000 is set up in Canal accounting for working capital and is credited to capital investment account

in addition to funds used for construction and equipment, the total constituting the base for capital interest computations. The balance of \$15,540,836.69 in excess of the revolving fund represents obligated balances of appropriated funds shown on the balance sheet, table No. 1, under equity of United States Government.

TABLE No. 22.—*Capital investment*

Appropriations for Canal construction to July 1, 1921 (detail in annual report for 1924, table No. 3)-----	\$386, 910, 301. 00		
Deduct value of capital stock of the Panama Railroad Company-----	7, 000, 000. 00		
Net construction appropriation-----	379, 910, 301. 00		
Annual payments to the Republic of Panama, 1913 to 1920 (State Department)-----	2, 000, 000. 00		
Additional Construction Funds, July 1, 1921, to July 1, 1951-----	\$226, 746, 897. 05		
Less:			
Transfers to Panama Railroad:			
Fiscal year 1950-----	\$232, 181. 67		
Fiscal year 1951-----	3, 826, 205. 55		
Special item projects written out of account-----	17, 090, 822. 93		
Other property written out of account----	50, 507. 82	21, 199, 717. 97	205, 547, 179. 08
Total appropriations-----	587, 457, 480. 08		
Interest on construction funds (compounded annually) 1904 to 1920-----	128, 991, 063. 00		
Total-----	716, 448, 543. 08		

The capital investment account covers the following assets, showing the total as of July 1, 1950, the change for the current fiscal year, and the total as of June 30, 1951:

	July 1, 1950	Change	June 30, 1951
Buildings and structures, (general) (table No. 8)-----	\$114, 413, 405. 11	(\$8, 421, 336. 05)	\$105, 992, 069. 06
Floating plant (table No. 9)-----	14, 180, 679. 08	1, 037, 810. 70	15, 218, 489. 78
Business operations structures (table No. 10)-----	53, 930, 726. 31	(2, 002, 083. 76)	51, 928, 642. 55
Business operations equipment (table No. 11)-----	6, 774, 854. 57	(2, 015, 524. 30)	4, 759, 330. 27
Total depreciable assets-----	189, 299, 665. 07	(11, 401, 133. 41)	177, 898, 531. 66
Nondepreciable assets (table No. 13)-----	396, 895, 146. 02	2, 129, 683. 79	399, 024, 829. 81
Special item projects-----	67, 512, 840. 90	(15, 925, 211. 43)	51, 587, 629. 47
Additional facilities-----	70, 417, 571. 30	(425, 352. 36)	69, 992, 218. 94
Defense and excess plant-----		7, 945, 333. 20	7, 945, 333. 20
Working capital (table No. 21)-----	10, 000, 000. 00		10, 000, 000. 00
Total capital investment-----	734, 125, 223. 29	(17, 676, 680. 21)	716, 448, 543. 08
Less: Accrued depreciation (table No. 12)-----	61, 163, 080. 62	28, 576, 842. 81	89, 739, 923. 43
Total capital investment-----	672, 962, 142. 67	(46, 253, 523. 02)	626, 708, 619. 65

() Denotes decrease.

The total capital investment at the close of the fiscal year 1951 amounted to \$626,708,619.65. The net decrease of \$46,253,523.02 is the result of normal capital additions and retirements and a number of extraordinary adjustments affecting prior years' operations. Some of the more important adjustments are as follows:

Transfers to Panama Railroad Company.....	\$3, 826, 205. 55
Special item projects (Canal defense) expenditures having no intrinsic value, written out of account.....	17, 090, 822. 93
Short depreciation on:	
Locks, dams, and spillways.....	15, 386, 608. 38
Electric power system.....	1, 011, 579. 74
Water system.....	668, 637. 82
Quarters.....	3, 288, 160. 51
Provision for economic valuation reserves:	
Dry docks.....	2, 681, 006. 00
Industrial bureau.....	1, 898, 639. 93
Miscellaneous adjustments.....	401, 862. 16
	<hr/>
	46, 253, 523. 02

Capital additions, retirements, and adjustments are shown on tables Nos. 8, 9, 10, 11, 12, 13, and 21.

Interest on the investment from 1921 to date is considered as a charge to operating expenses, and while this charge does not appear on the balance sheet, a statement of such interest compared with net revenues, by years, is shown on table No. 24. Interest for the current fiscal year amounting to \$15,635,933.16 is based on a revised July 1, 1950, capital investment, as follows:

Depreciable assets.....	\$189, 299, 665. 07
Nondepreciable assets.....	396, 895, 146. 02
Working capital.....	10, 000, 000. 00
	<hr/>
Total.....	596, 194, 811. 09
Less: Transfer to Panama Railroad Company and surplus and excess plant.....	21, 341, 756. 81
	<hr/>
Total capital used in fiscal year 1951 operations.....	574, 853, 054. 28
	<hr/> <hr/>
Deduct:	
Accrued depreciation on depreciable assets.....	61, 163, 080. 62
Less accrued depreciation on property transferred to Panama Railroad Company and surplus and excess plant.....	7, 507, 799. 21
	<hr/>
Total depreciation applicable to above.....	53, 655, 281. 41
	<hr/> <hr/>
Net capital investment for interest.....	521, 197, 772. 89

TABLE No. 23.—*Consolidated statement of income, expenses, and net revenues*

	Fiscal year 1951	Fiscal year 1950
Canal operations:		
Canal Revenues:		
Tolls.....	\$23,951,827.98	\$24,511,713.00
Other miscellaneous receipts.....	169,240.28	258,895.18
Total Canal revenues (table No. 26).....	24,121,068.26	24,770,608.18
Canal earnings (table No. 27).....	7,822,588.96	7,981,855.31
Total Revenues.....	31,943,657.22	32,752,463.49
Canal expenses:		
Administration.....	2,922,057.61	2,897,020.41
Operation and maintenance.....	13,812,520.99	13,360,823.71
General services.....	3,705,933.89	3,454,547.81
Sanitation.....	5,079,876.04	5,783,150.93
Civil government.....	4,239,888.56	4,210,984.58
Postal service.....	794,140.99	793,315.81
Total expenses.....	30,554,418.11	30,499,843.25
Net Canal revenues or (deficit) (table No. 27).....	1,389,239.11	2,252,620.24
Fixed capital charge.....	14,677,249.80	14,710,007.72
Surplus or (deficit).....	(13,288,010.69)	(12,457,387.48)
Business operations:		
Business revenues.....	28,109,448.46	33,496,343.78
Business expenses.....	27,471,581.13	32,918,779.73
Net business revenues.....	¹ 637,867.33	577,564.05
Fixed capital charge.....	958,683.36	1,314,400.98
Surplus or (deficit).....	(320,816.03)	(736,836.93)
Combined operations:		
Revenues.....	60,053,105.68	66,248,807.27
Expenses.....	58,025,999.24	63,418,622.98
Net revenues.....	2,027,106.44	2,830,184.29
Fixed capital charge at 3 percent.....	15,635,933.16	16,024,408.70
Surplus or (deficit).....	(13,608,826.72)	(13,194,224.41)
Net capital investment (table No. 22).....	521,197,772.89	534,146,956.60
Combined net revenues.....	2,027,106.44	2,830,184.29
Percent of capital return.....	.39	.53

() Denotes deficit.

¹ Net business revenues amounting to \$637,867.33 has been converted to a total deficit of \$5,898,484.41 as a result of various adjustments of prior years earnings as detailed on table No. 15.

A summary comparison of net revenues and capital interest, by years, from 1921 to date, is shown on table No. 24, following, together with a brief description of accounting policy governing charges to operating expenses.

Table No. 27, canal earnings and expenses, details by function earnings and expenses for the fiscal year 1951.

TABLE No. 24.—*Revenues, expenses, and computed surplus*

Fiscal year	Tolls	Civil revenues	Business profits	Total revenues
1914-20.....	\$33,303,581.67	\$1,206,579.86	\$536,098.34	\$35,046,259.87
1921-30.....	213,916,006.73	2,625,096.66	7,649,042.27	224,190,145.66
1931-40.....	227,122,409.80	1,696,549.53	9,020,856.47	237,839,815.80
1941-50.....	145,589,694.60	2,131,178.21	11,287,163.68	159,008,036.49
1951.....	23,951,827.98	169,240.28	¹ (5,898,484.41)	18,222,583.85
Total.....	643,883,520.78	7,828,644.54	22,594,676.35	674,306,841.67

¹ Actual business profits of \$637,867.33 have been adjusted by a net decrease in the amount of \$6,536,351.74 representing surplus adjustments applicable to prior fiscal years.

TABLE NO. 24.—*Revenues, expenses, and computed surplus*—Continued

Fiscal year	Appropriation expense	Net revenues	Capital interest, 3 percent	Computed surplus
1914-20.....	\$36,657,766.89	(\$1,611,507.02)	-----	(\$1,611,507.02)
1921-30.....	91,552,150.11	132,637,995.55	\$150,571,898.92	(17,933,903.37)
1931-40.....	97,628,588.71	140,211,227.09	151,090,143.98	(10,878,916.89)
1941-50.....	153,419,181.38	5,588,855.11	155,076,648.70	(149,487,793.59)
1951.....	22,085,136.65	(3,862,552.80)	15,635,933.16	(19,498,485.96)
Total.....	401,342,823.74	272,964,017.93	472,374,624.76	(199,410,606.83)

The foregoing table summarizes by classes the revenues received by the Panama Canal by fiscal years from 1921 and shows the net results from operations after deducting therefrom the net current expenses chargeable to appropriations and the current interest charge on the capital investment. The interest rate of 3 percent has been used in making computations a great many years. The use of this rate received the approval of two organizations which investigated Panama Canal matters and was formally adopted when the present accounting system was established in 1932. It has been considered a fair and reasonable rate, as the Government at various times has paid much higher rates for the use of money.

Interest chargeable to operations is not included on the balance sheet and no interest charge against the Canal is actually made by the United States Treasury.

Total revenues on the foregoing statement represent receipts which must be covered into the United States Treasury and relinquished from control of the Panama Canal. Earnings repayable to Canal appropriations, and reexpendable by the Canal, are deducted from gross operating expenditures, in order to present a comparison of funds covered into the treasury with funds chargeable to operating account, exclusive of capital additions.

The absence of tax charges is compensated for by the inclusion in Canal operating accounts of the direct costs of civil government, health and welfare activities. Neither capital nor operating expense of the Panama Canal include the cost of the military and naval establishments on the Isthmus; however, all important exchanges of services with those interests are covered by cash settlements, or reciprocal allowances.

By including in the accounts all revenues properly applicable to Canal activities and by charging against the total revenue the net appropriation expenses, including charges for depreciation and interest at 3 percent on the capital invested by excluding any charge to amortize the investment, there has accumulated as of June 30, 1951, as shown by the above table, a deficit of \$199,410,606.83.

TABLE NO. 25.—*Capital refundments*

Balance June 30, 1950	\$327, 675, 457. 92
Cash covered into U. S. Treasury	24, 661, 231. 06
Business profits (table No. 2)	\$667, 219. 19
Revenue due U. S. Treasury (table No. 7)	23, 994, 011. 87
Total	352, 336, 688. 98
Appropriations, fiscal year 1951 (detail below)	\$18, 827, 970. 30
Less: Net capital additions, current year:	
Decrease as shown on table	
No. 22	\$17, 676, 680. 21
Less: Special item projects	
written out of account	17, 090, 822. 93 (585, 857. 28)
Net appropriation for operating account and incomplete construction	19, 413, 827. 58
Net capital refundments, June 30, 1951	332, 922, 861. 40

Schedule of appropriations

Fiscal year	Maintenance and operations	Sanitation	Civil government	Construction additional facilities	Miscellaneous	Annual payment to Panama	Total
1914 to 1930	\$98, 658, 211	\$10, 921, 482	\$13, 533, 870		\$151, 344. 55	\$2, 500, 000	\$125, 764, 907. 55
1931 to 1940	103, 097, 767	8, 389, 410	11, 551, 910		1, 346, 307. 87	3, 760, 000	128, 145, 394. 87
1941	38, 292, 667	1, 045, 393	1, 192, 011	\$15, 000, 000	325, 000. 00	430, 000	56, 285, 071. 00
1942	29, 595, 286	1, 635, 223	1, 295, 017	34, 932, 000		430, 000	67, 887, 526. 00
1943	40, 152, 437	1, 692, 800	1, 609, 373	56, 826, 800	277, 000. 00	430, 000	100, 988, 410. 00
1944	6, 016, 000	1, 814, 000	1, 228, 100	(30, 257, 572)	(40, 000. 00)	430, 000	(20, 809, 472. 00)
1945	5, 850, 000	1, 854, 000	1, 476, 400			430, 000	9, 610, 400. 00
1946	(276, 000)	2, 261, 200	1, 756, 000	3, 428, 600	(24, 491. 74)	430, 000	7, 575, 308. 26
1947	12, 749, 000	2, 860, 000	2, 763, 000			430, 000	18, 802, 000. 00
1948	13, 374, 000	3, 552, 000	2, 900, 000	750, 000	508, 987. 88	430, 000	21, 514, 987. 88
1949	13, 149, 000	4, 200, 000	3, 277, 313	100, 000	2, 978, 341. 90	430, 000	24, 134, 654. 90
1950	14, 500, 000	3, 300, 000	3, 450, 000		(106, 494. 17)	430, 000	21, 573, 505. 83
1951	14, 761, 700	3, 390, 000	3, 849, 000		¹ (3, 602, 729. 70)	430, 000	18, 827, 970. 30
Total	389, 920, 068	46, 915, 508	49, 881, 994	80, 779, 828	1, 813, 266. 59	10, 990, 000	580, 300, 664. 59
Net capital additions, 1922 to 1951 (table No. 22)							226, 746, 897. 05
Total							353, 553, 767. 54
Less special item projects written out of account							17, 090, 822. 93
Net appropriations for Canal maintenance and operations and incomplete construction							336, 462, 944. 61

¹ Property transferred to the Panama Railroad Company \$3, 826, 205. 55
 Other property written out of account 50, 507. 82

Total 3, 876, 713. 37

Deduct:

Property transferred from Panama Canal clubhouses 65, 935. 65
 Property transferred from U. S. Navy 148, 048. 02
 Property transferred from U. S. Army 60, 000. 00

Total 273, 983. 67

Total 3, 602, 729. 70

The total deposits covered into the United States Treasury from the beginning of Canal construction, with minor adjustments to reconcile changes in accounting process, amount to \$690,585,523.98, and, deducting therefrom net appropriations for operation and incomplete construction amounting to \$336,462,944.61 as shown above, and \$21,199,717.97 covering property transferred to other government agencies and special item projects (Canal defense) expenditures written out of account as shown on table No. 22, produce the net capital refundment balance of \$332,922,961.40. Deposits covered into the Treasury consist principally of the earned revenues cited in table No. 24, which total \$674,306,841.67, the balance being made up of sales of property, principally during the construction period, and return of appropriation balances.

Although above table shows a net cash refundment of \$332,922,-861.40 such refundment is not deductible from net capital investment as shown in table No. 22, which is considered as measuring the value of the Panama Canal as an instrument of public utility upon which a perpetual return should be earned; furthermore, annual interest on net asset valuation chargeable to operating account is not included in cash transactions with the United States Treasury. Such interest at 3 percent from 1921 to 1951 would have amounted to \$472,374,624.76 as shown on table No. 24, and would have extinguished all capital refundments to date, if such interest charges had been assessed against Canal revenues.

TABLE NO. 26.—*Canal revenues*

	Fiscal year 1951	Fiscal year 1950
Tolls.....	\$23,951,827.98	\$24,511,713.00
Licenses, fees, fines, etc.....	165,691.24	255,658.13
Miscellaneous.....	3,549.04	3,237.05
Total.....	24,121,068.26	24,770,608.18

Canal revenues shown above comprise earnings which by law must be covered into the United States Treasury as miscellaneous receipts, United States revenues, as distinguished from earnings repayable to Canal appropriations shown on tables Nos. 15 and 27.

TABLE NO. 27.—*Canal earnings and expenses, fiscal year 1951*

	Expenses	Earnings	Net expenses
Maintenance and operation:			
Administration:			
Governor's office and staff	\$213,737.67	\$54,629.01	\$159,108.66
Finance bureau	1,512,144.77	859,977.60	652,167.17
Personnel bureau	916,818.26	152,487.98	764,330.28
Administrative branch	279,356.94	75,101.65	204,255.29
Total	2,922,057.64	1,142,196.24	1,779,861.40
Canal operation and maintenance:			
Director's office, marine bureau	27,941.74	6,812.87	21,128.87
Navigation division	2,838,763.90	1,642,556.72	1,196,207.18
Damage to vessels	21,592.62	-----	21,592.62
Locks division	4,774,040.58	-----	4,774,040.58
Maintenance of dams, reservoirs, and spillways	118,713.58	-----	118,713.58
Dredging division	2,936,260.34	273,014.80	2,663,245.54
Aids to navigation section	597,022.41	108,888.75	488,133.66
Depreciation Canal general property	1,500,000.00	-----	1,500,000.00
Depreciation floating plant	568,185.82	-----	568,185.82
Annual payment to Republic of Panama	430,000.00	-----	430,000.00
Total	13,812,520.99	2,031,273.14	11,781,247.85
General services:			
Director's office, engineering and construction bureau	31,548.57	29,000.00	2,548.57
Engineering division	1,008,207.11	774,808.10	233,399.01
Meteorological and hydrographic branch	110,053.31	351.00	109,702.31
Maintenance of highways	180,132.38	-----	180,132.38
Ferry service	362,993.71	13,867.97	349,125.74
Maintenance of street lighting system	22,816.37	-----	22,816.37
Maintenance of sewers	77,595.88	-----	77,595.88
Community services	1,335,823.32	855,376.63	480,446.69
Offices in the United States	528,284.92	146,284.92	382,000.00
Omitted overtime claims (maintenance and operation)	20,522.41	-----	20,522.41
Civil defense	27,955.91	-----	27,955.91
Total	3,705,933.89	1,819,688.62	1,886,245.27
Total Maintenance and Operation	20,440,512.52	4,993,158.00	15,447,354.52
Sanitation:			
Gorgas Hospital	2,417,045.10	758,977.18	1,658,067.92
Colon Hospital	550,158.25	151,441.34	398,716.91
Margarita Hospital	2,177.63	308.02	1,869.61
Corozal Hospital	365,312.83	77,039.03	288,273.80
Palo Seco Leprosarium	105,625.28	94,100.73	11,524.55
Public health	1,639,556.95	676,136.68	963,420.27
Total sanitation	5,079,876.04	1,758,002.98	3,321,873.06
Civil government:			
Civil affairs bureau	18,844.92	301.11	18,543.81
License bureau	33,457.88	-----	33,457.88
Library	63,248.19	2,991.99	60,256.20
Customs and immigration	390,346.98	36,176.15	354,170.83
Schools	1,901,002.18	162,436.11	1,738,566.07
Police division	1,268,327.96	153,540.31	1,114,787.65
Fire division	455,080.16	348.00	454,732.16
Magistrates court	42,121.65	-----	42,121.65
District court	9,052.75	-----	9,052.75
Civil intelligence	58,405.89	-----	58,405.89
Total civil government	4,239,888.56	355,793.67	3,884,094.89
Postal service	794,140.99	715,634.31	78,506.68
Total	30,554,418.11	7,822,588.96	22,731,829.15

SUMMARY

Canal revenues (table No. 26)	\$24,121,068.26
Net canal expenses	22,731,829.15
Net canal revenues (table No. 23)	1,389,239.11

The earnings of the divisions engaged in the transiting of vessels through the Canal, as well as earnings of the Canal Zone postal service, sanitation and civil government divisions, are deducted from gross expenses to arrive at the net expenditure from Canal appropriations, which in turn is deducted from Canal revenues to arrive at net Canal revenues, exclusive of business division profits.

Earnings of the executive offices and finance bureau represent principally a proportional charge against business divisions of the Panama Canal and the Panama Railroad Company. Business divisions are reimbursed for this proportional expense by adding a percentage of overhead to the direct cost on all work performed. The Panama Railroad's proportion is distributed to the various units of that organization.

The earnings of the offices in the United States comprise charges against storehouse operations to cover a proportional part of the cost of purchasing, inspection, and handling of material used by divisions of the Panama Canal and the Panama Railroad Company or sold to outside interests, which expense is recovered by adding a fixed percentage to the price of material.

TABLE No. 28.—*Balances in appropriations and funds, June 30, 1951*

ASSETS							
	Cash on hand	Accounts receivable	Transfers available	Work in progress and suspense	Storehouse stock	Total	
Maintenance and operation, Panama Canal	\$10,047,211.05	\$1,935,221.36	\$345,954.11	\$105,643.01	\$10,777,295.25	\$23,211,324.78	
Sanitation, Canal Zone, Panama Canal	642,013.41	240,935.23	-----	-----	308,500.12	1,191,448.76	
Civil government, Panama Canal and Canal Zone	410,516.94	18,185.20	-----	350.00	-----	429,052.14	
Postal operating fund, Canal Zone postal service	560,614.83	4,175.00	-----	-----	-----	564,789.83	
Memorial to Maj. Gen. George W. Goethals	156,508.58	-----	-----	3,491.42	-----	160,000.00	
Construction, additional facilities, Panama Canal	195,799.26	-----	9.13	-----	-----	195,808.39	
Miscellaneous receipts, United States revenues	8,973.58	392,791.86	(3,697,215.35)	-----	-----	(3,295,449.91)	
Total	12,021,637.65	2,591,308.65	(3,351,252.11)	109,484.43	11,085,795.37	22,456,973.99	
LIABILITIES							
	Working capital allotment	Accounts payable	Transfers payable	Special liabilities	Funded reserves	Appropriation balance	Total
Maintenance and operation, Panama Canal	\$9,510,000.00	\$2,225,434.17	(\$3,697,215.35)	\$318,330.77	\$10,516,147.78	\$4,338,637.41	\$23,211,324.78
Sanitation, Canal Zone, Panama Canal	480,000.00	282,207.54	172,467.90	37,710.07	-----	219,063.25	1,191,448.76
Civil government, Panama Canal and Canal Zone	10,000.00	150,549.82	160,792.41	15,275.59	-----	92,434.32	429,052.14
Postal operating fund, Canal Zone postal service	-----	525,874.17	12,702.93	7,219.14	-----	18,993.59	564,789.83
Memorial to Maj. Gen. George W. Goethals	-----	248.05	-----	-----	-----	160,000.00	160,000.00
Construction, additional facilities, Panama Canal	-----	(3,295,449.91)	-----	-----	-----	195,560.34	195,808.39
Miscellaneous receipts, United States revenues	-----	-----	(3,351,252.11)	378,525.57	10,516,147.78	5,024,688.91	(3,295,449.91)
Total	10,000,000.00	(111,136.16)	(3,351,252.11)	378,525.57	10,516,147.78	5,024,688.91	22,456,973.99

This table shows the status of Panama Canal working capital by the various appropriations and funds by which it is separately accountable under existing laws and Treasury regulations.

A revolving fund of \$10,000,000 is set aside in Canal accounting to cover the net investment in current accounts, which sum is included in the capital investment account appearing on table 22.

Tables Nos. 18, 19, and 20 show the detail of the funded reserves stated in the foregoing table as \$10,516,147.78.

TABLE No. 29.—*Ocean-going tolls-paying traffic¹ for fiscal years 1915 to 1951*

Fiscal year ended June 30—	Number of transits	Panama Canal net tonnage ²	Tolls	Tons of cargo
1915 ³	1,058	3,507,000	\$4,366,747.13	4,888,400
1916 ⁴	724	2,212,000	2,403,089.40	3,093,335
1917	1,738	5,357,000	5,620,799.83	7,054,720
1918	1,989	6,072,000	6,428,780.26	7,525,768
1919	1,948	5,558,000	6,154,290.79	6,910,097
1920	2,393	7,898,000	8,507,938.68	9,372,374
1921	2,791	10,550,000	11,268,681.46	11,595,971
1922	2,665	10,556,000	11,191,828.56	10,882,607
1923	3,908	17,206,000	17,504,027.19	19,566,429
1924	5,158	24,181,000	24,284,659.92	25,993,167
1925	4,592	21,134,000	21,393,718.01	23,956,549
1926	5,087	22,906,000	22,919,931.89	26,030,016
1927	5,293	24,245,000	24,212,250.61	27,733,555
1928	6,253	27,229,000	26,922,200.75	29,615,651
1929	6,289	27,585,000	27,111,125.47	30,647,768
1930	6,027	27,716,000	27,059,998.94	30,018,429
1931	5,370	25,690,000	24,624,599.76	25,065,283
1932	4,332	21,842,000	20,694,704.61	19,798,986
1933	4,162	21,094,000	19,601,077.17	18,161,165
1934	5,234	26,410,000	24,047,183.44	24,704,009
1935	5,180	25,720,000	23,307,062.93	25,309,527
1936	5,382	25,923,000	23,479,114.21	26,505,943
1937	5,387	25,430,000	23,102,137.12	28,108,375
1938	5,524	25,950,383	23,169,888.70	27,385,924
1939	5,903	27,170,007	23,661,021.08	27,866,627
1940	5,370	24,144,366	21,144,675.36	27,299,016
1941	4,727	20,642,736	18,157,739.68	24,950,791
1942	2,688	11,010,004	9,752,207.38	13,607,444
1943	1,822	8,233,999	7,356,684.94	10,599,966
1944	1,562	6,073,457	5,456,163.32	7,003,487
1945	1,939	8,380,959	7,243,601.58	8,603,607
1946	3,747	17,516,517	14,773,692.98	14,977,940
1947	4,260	20,233,043	17,596,602.46	21,670,518
1948	4,678	22,902,064	19,956,593.28	24,117,788
1949	4,793	23,473,236	20,541,229.52	25,305,158
1950	5,448	28,013,236	24,430,206.42	28,872,293
1951	5,593	27,180,425	23,906,082.06	30,073,022
Total	151,044	687,045,432	643,362,336.89	735,871,705

¹ Includes only vessels of 300 net tons and over (Panama Canal measurement) for vessels rated on net tonnage, or 500 tons displacement and over for vessels rated on displacement tonnage.

² Panama Canal net tonnages prior to 1939 are estimated figures based on revised measurement rules which became effective Mar. 1, 1938.

³ Canal opened to traffic Aug. 15, 1914.

⁴ Canal closed to traffic approximately 7 months of fiscal year by slides.

TABLE No. 30.—*Traffic by months—fiscal years 1951 and 1950*

	Number of transits		Panama Canal net tonnage		Tons of cargo		Tolls	
	1950-51	1949-50	1950-51	1949-50	1950-51	1949-50	1950-51	1949-50
July	513	430	2,718,923	2,155,660	2,856,787	2,386,547	\$2,372,995.08	\$1,891,601.40
August	453	388	2,401,882	1,973,663	2,452,126	1,979,390	2,093,177.16	1,732,941.00
September	446	401	2,250,773	2,053,851	2,356,325	2,125,177	1,982,477.96	1,794,757.14
October	480	440	2,357,687	2,267,323	2,477,787	2,296,286	2,068,180.72	1,984,842.18
November	446	439	2,095,918	2,265,860	2,235,757	2,079,164	1,844,350.80	1,963,985.22
December	452	488	2,134,588	2,514,082	2,215,943	2,637,558	1,885,813.24	2,184,971.48
January	452	483	2,103,051	2,556,647	2,337,757	2,507,978	1,854,308.34	2,207,232.80
February	444	457	2,106,445	2,443,661	2,433,399	2,565,017	1,853,277.84	2,120,923.28
March	474	522	2,199,642	2,666,795	2,712,825	2,762,230	1,942,915.46	2,326,837.14
April	470	459	2,270,187	2,239,279	2,667,927	2,364,940	2,006,621.16	1,959,087.12
May	485	488	2,295,021	2,484,592	2,694,743	2,605,697	2,020,053.78	2,169,833.58
June	478	453	2,246,308	2,391,823	2,631,646	2,562,309	1,981,910.52	2,093,194.08
Total	5,593	5,448	27,180,425	28,013,236	30,073,022	28,872,293	23,906,082.06	24,430,206.42
Average per month	466	454	2,264,035	2,334,436	2,506,085	2,406,024	1,992,173.50	2,035,850.54

NOTES.—The above includes only tolls-paying vessels of 300 net tons or over, Panama Canal measurement, or of 500 displacement tons or over on vessels rated on displacement basis (dredges, warships, etc.).

TABLE NO. 31.—*Canal traffic¹ by nationality of vessels*

Nationality	Number of transits	Measured tonnage			Tolls	Tons of cargo
		Panama Canal net	Registered			
			Gross	Net		
Belgian.....	1	4,495	6,660	5,036	\$4,045.50	8,489
British.....	1,004	5,780,215	7,644,823	4,603,876	5,150,215.06	6,414,452
Chilean.....	52	225,024	325,576	185,081	202,521.60	252,056
Chinese.....	6	31,482	43,809	26,567	28,333.80	49,024
Colombian.....	75	102,306	158,383	88,281	91,913.76	76,863
Costa Rican.....	3	6,597	9,494	5,863	5,937.30	9,994
Danish.....	191	759,151	873,756	507,457	678,520.98	708,735
Ecuadorian.....	247	235,883	377,924	235,979	207,828.00	98,358
Finnish.....	1	3,560	3,889	2,209	3,204.00	196
French.....	108	566,378	728,525	430,851	511,868.36	584,476
German.....	4	11,004	11,660	6,054	8,913.24	4,994
Greek.....	103	537,586	729,676	448,152	478,223.82	814,064
Honduran.....	346	906,398	1,465,807	847,137	774,738.18	546,821
Icelandic.....	3	2,397	2,916	1,137	1,869.66	346
Italian.....	70	391,267	550,258	321,827	348,510.78	353,177
Japanese.....	40	201,083	266,942	159,026	180,974.70	317,796
Liberian.....	23	63,640	88,592	56,273	56,733.84	96,595
Mexican.....	9	28,643	39,892	22,469	25,258.12	34,359
Netherlands.....	115	491,487	633,517	374,543	441,156.66	492,295
Nicaraguan.....	8	4,746	8,909	4,200	4,048.56	1,751
Norwegian.....	513	2,325,651	2,529,223	1,504,536	2,045,341.98	2,090,632
Panamanian.....	220	1,069,948	1,368,814	837,426	861,780.06	1,270,909
Peruvian.....	26	52,514	72,585	42,508	48,348.54	64,770
Philippine.....	25	128,596	144,724	86,496	115,736.40	141,972
Portuguese.....	9	40,526	43,446	26,075	32,373.00	30,089
Spanish.....	23	88,039	114,613	69,530	71,897.94	86,752
Swedish.....	148	668,854	801,700	583,413	598,088.52	625,179
United States.....	2,203	12,469,276	16,900,402	9,937,822	10,888,388.60	14,881,540
Venezuelan.....	17	43,679	85,935	42,551	39,311.10	16,338
Totals:						
1951.....	5,593	27,180,425	36,032,450	21,462,378	23,906,082.06	30,073,022
1950.....	5,448	28,013,236	37,291,073	22,267,207	24,430,206.42	28,872,293
1949.....	4,793	23,473,236	31,726,407	18,843,815	20,541,229.52	25,305,158

¹ Includes only tolls-paying vessels of 300 net tons or over, Panama Canal measurement, or of 500 displacement tons or over on vessels rated on displacement basis (dredges, warships, etc.).

NOTE.—In Canal traffic statistics, foreign naval vessels such as transports, supply ships, tankers, etc., with a measurement of 300 net tons (Panama Canal measurement) or more, and vessels of war, dredges, etc., with a displacement of 500 tons or more are classified as ocean-going tolls-paying vessels. Statistics on these vessels, except such as pertain to displacement tonnage, have been included in the traffic summaries shown in the preceding tables. Since displacement tonnage cannot be combined with net tonnage, the following table presents statistics on the 21 vessels which transited the Canal during the fiscal year 1951 and paid tolls on displacement tonnage:

Nationality	Type	Number of transits	Displacement tonnage	Tolls
British.....	Naval.....	8	24,809	\$12,404.50
French.....	do.....	1	15,700	7,850.00
Netherlands.....	do.....	1	2,460	1,230.00
Mexican.....	do.....	4	3,119	1,559.50
Peruvian.....	do.....	6	5,811	2,920.50
United States.....	Dredge.....	1	2,710	1,355.00
Total.....		21	54,639	27,319.50

TABLE No. 32.—Classification of Canal traffic ¹ by type of vessel—fiscal year 1951

	Vessels of United States registry			Vessels of foreign registry			Total traffic	
	Atlantic to Pacific	Pacific to Atlantic	Total	Atlantic to Pacific	Pacific to Atlantic	Total	Atlantic to Pacific	Total
CARGO AND CARGO PASSENGER SHIPS								
Tank ships, laden:								
Number of transits.....	56	96	152	82	25	107	138	259
Panama Canal net tonnage.....	367,423	715,426	1,082,849	419,022	156,003	575,025	780,445	1,668,774
Tolls.....	\$330,681	\$643,883	\$974,564	\$377,120	\$141,213	\$518,333	\$707,801	\$1,492,897
Cargo (long tons).....	618,900	1,438,415	2,057,375	811,898	282,139	1,094,037	1,430,858	3,121,432
Tank ships, ballast:								
Number of transits.....	66	40	106	17	62	79	83	185
Panama Canal net tonnage.....	498,863	262,251	761,114	98,956	295,874	394,830	597,819	1,155,944
Tolls.....	\$359,181	\$188,821	\$548,002	\$71,248	\$213,029	\$284,277	\$430,429	\$832,279
Ore ships, laden:								
Number of transits.....	118	118	236	—	—	—	—	118
Panama Canal net tonnage.....	—	524,788	524,788	—	—	—	—	524,788
Tolls.....	—	\$472,309	\$472,309	—	—	—	—	\$472,309
Cargo (long tons).....	—	2,747,200	2,747,200	—	—	—	—	2,747,200
Ore ships, ballast:								
Number of transits.....	117	—	117	—	—	—	117	117
Panama Canal net tonnage.....	520,068	—	520,068	—	—	—	520,068	520,068
Tolls.....	\$374,449	—	\$374,449	—	—	—	\$374,449	\$374,449
Passenger ships, laden: ²								
Number of transits.....	57	52	109	90	93	183	147	292
Panama Canal net tonnage.....	369,108	327,808	696,916	602,740	639,375	1,242,115	971,848	1,939,031
Tolls.....	\$332,197	\$295,027	\$627,224	\$542,466	\$575,438	\$1,117,904	\$874,063	\$1,745,128
Cargo (long tons).....	194,477	356,145	550,622	356,148	485,970	852,118	550,625	1,402,740
Passenger ships, ballast: ²								
Number of transits.....	—	—	—	2	—	2	2	2
Panama Canal net tonnage.....	—	—	—	4,154	—	4,154	4,154	4,154
Tolls.....	—	—	—	\$2,991	—	\$2,991	\$2,991	\$2,991
General cargo ships, laden: ³								
Number of transits.....	640	793	1,433	1,176	1,408	2,644	1,816	4,077
Panama Canal net tonnage.....	3,884,939	4,410,908	8,295,847	5,334,206	6,178,844	11,513,050	9,219,145	19,808,897
Tolls.....	\$3,496,445	\$3,969,817	\$7,466,262	\$4,800,785	\$5,560,960	\$10,361,745	\$8,297,230	\$17,828,007
Cargo (long tons).....	3,908,115	5,618,228	9,526,343	5,242,874	8,032,453	13,275,327	9,150,989	22,801,650
General cargo ships, ballast: ³								
Number of transits.....	146	6	152	309	41	350	455	592
Panama Canal net tonnage.....	533,506	33,296	566,792	863,688	114,807	978,555	1,397,194	1,545,347
Tolls.....	\$384,124	\$23,966	\$408,090	\$621,856	\$82,704	\$704,560	\$1,005,980	\$1,112,650

OTHER TYPE SLIPS

OTHER TYPE SHIPS									
Naval vessels:									
Number of transits.....	41	1	13	7	20	14	7	21	
Displacement tonnage.....	2,710	2,710	32,479	19,450	51,929	35,189	19,450	54,639	
Tolls.....	\$1,355	\$1,355	\$16,240	\$9,725	\$23,965	\$17,595	\$9,725	\$27,320	
Cable ships, yachts, etc.:									
Number of transits.....	8	15	4	1	5	12	8	20	
Displacement tonnage.....	15,609	20,902	2,060	460	2,520	17,669	5,753	23,423	
Panama Canal net tonnage.....	\$11,780	\$16,132	\$1,589	\$331	\$1,920	\$13,369	\$4,683	\$18,052	
SUMMARY									
Total cargo and cargo-passenger ships, laden:									
Number of transits.....	753	1,812	1,348	1,586	2,934	2,101	2,645	4,746	
Displacement tonnage.....	4,621,470	10,600,400	6,355,968	6,975,122	13,331,090	10,977,438	12,954,052	23,331,490	
Tolls.....	\$4,159,323	\$9,540,359	\$5,720,371	\$6,277,611	\$11,997,982	\$9,879,694	\$11,658,047	\$21,638,441	
Cargo (long tons)	4,721,552	14,881,540	6,410,920	8,780,562	15,191,482	11,132,472	18,940,550	30,073,022	
Total cargo and cargo-passenger ships, ballast:									
Number of transits.....	329	375	328	103	431	657	149	806	
Displacement tonnage.....	1,552,487	1,847,074	966,708	410,741	1,377,539	2,519,235	706,278	3,225,513	
Tolls.....	\$1,117,754	\$1,330,541	\$690,093	\$295,733	\$991,828	\$1,813,849	\$508,520	\$2,322,369	
Total other type ships:									
Number of transits.....	9	16	17	8	25	26	15	41	
Displacement tonnage.....	15,609	20,902	2,060	400	2,520	17,669	5,753	23,422	
Tolls.....	\$13,135	\$17,487	\$17,829	\$10,056	\$27,885	\$30,964	\$14,408	\$45,372	
Grand total ships:									
Number of transits.....	1,091	2,203	1,693	1,697	3,390	2,764	2,809	5,593	
Displacement tonnage.....	6,189,516	12,469,276	7,324,826	7,386,323	14,711,149	13,514,342	13,666,083	27,180,425	
Tolls.....	\$5,290,212	\$10,888,387	\$6,434,295	\$6,583,400	\$13,017,695	\$11,724,507	\$12,181,575	\$23,906,082	
Cargo (long tons)	4,721,552	14,881,540	6,410,920	8,780,562	15,191,482	11,132,472	18,940,550	30,073,022	

2 Vessels certificated for more than 12 passengers.

³ Vessels certificated for 12 passengers or less or without passenger accommodations.

4 Dredge.

¹ Includes only tolls-paying vessels of 300 net tons and over (Panama Canal measurement) for vessels rated on net tonnage, or of 500 tons displacement for vessels rated on displacement tonnage.

TABLE NO. 33.—*Laden and ballast traffic by nationality of vessels, fiscal year 1951*

	Laden			Ballast		
	Number of transits	Panama Canal net tonnage	Tolls	Number of transits	Panama Canal net tonnage	Tolls
Belgian.....	1	4, 495	\$4, 045. 50			
British.....	918	5, 422, 532	4, 880, 278. 80	78	357, 683	\$257, 531. 76
Chilean.....	52	225, 024	202, 521. 60			
Chinese.....	6	31, 482	28, 333. 80			
Colombian.....	74	101, 408	91, 267. 20	1	898	646. 56
Costa Rican.....	3	6, 597	5, 937. 30			
Danish.....	178	732, 957	659, 661. 30	13	26, 194	18, 859. 68
Ecuadorian.....	199	211, 068	189, 961. 20	48	24, 815	17, 866. 80
Finnish.....	1	3, 560	3, 204. 00			
French.....	98	534, 590	481, 131. 00	9	31, 788	22, 887. 36
German.....	2	5, 502	4, 951. 80	2	5, 502	3, 961. 44
Greek.....	97	503, 455	455, 809. 50	6	31, 131	22, 414. 32
Honduran.....	260	678, 509	610, 558. 10	86	227, 889	164, 080. 08
Icelandic.....	1	799	719. 10	2	1, 598	1, 150. 56
Italian.....	66	371, 103	333, 992. 70	4	20, 164	14, 518. 08
Japanese.....	40	201, 083	180, 974. 70			
Liberian.....	17	60, 628	54, 565. 20	6	3, 012	2, 168. 64
Mexican.....	3	17, 087	15, 378. 30	2	11, 556	8, 320. 32
Netherlands.....	110	478, 089	430, 280. 10	4	13, 398	9, 646. 56
Nicaraguan.....	6	3, 508	3, 157. 20	2	1, 238	891. 36
Norwegian.....	425	2, 060, 407	1, 854, 356. 30	88	265, 244	190, 975. 68
Panamanian.....	162	747, 875	673, 087. 50	58	262, 073	188, 692. 56
Peruvian.....	17	42, 322	38, 089. 80	3	10, 192	7, 338. 24
Philippine.....	25	128, 596	115, 736. 40			
Portuguese.....	4	17, 746	15, 971. 40	5	22, 780	13, 401. 60
Spanish.....	12	47, 277	42, 549. 30	11	40, 762	29, 348. 64
Swedish.....	141	647, 298	582, 568. 20	7	21, 556	15, 520. 32
United States.....	1, 820	10, 605, 416	9, 545, 774. 40	382	1, 862, 860	1, 341, 259. 20
Venezuelan.....	17	43, 679	39, 311. 10			
Totals:						
1951.....	4, 755	23, 938, 092	21, 544, 282. 80	817	3, 242, 333	2, 334, 479. 76
1950.....	4, 507	23, 634, 850	21, 271, 365. 00	932	4, 378, 386	3, 152, 437. 92
1949.....	3, 943	19, 917, 820	17, 926, 038. 00	828	3, 555, 416	2, 559, 899. 52

NOTE.—The above table involves only tolls-paying vessels of 300 net tons or over, Panama Canal measurement.

TABLE No. 35.—Segregation of transits¹ by registered gross tonnage of vessels, fiscal year 1951

Nationality	Under 2,000	2,000 to 3,999	4,000 to 5,999	6,000 to 7,999	8,000 to 9,999	10,000 to 11,999	12,000 to 13,999	14,000 to 15,999	16,000 to 17,999	18,000 and over	Total ²	Registered gross tonnage	Average gross tonnage per vessel	
													1951	1950
Belgian				1	154	71	19	9	18	10	1	6,660	6,660	7,767
British	7	27	185	496	28						996	7,644,823	7,676	7,826
Chilean	2	19	3								52	325,576	6,261	7,607
Chinese				6							75	43,809	7,302	2,602
Colombian	55	12	8								75	158,383	2,112	
Costa Rican	2			1							3	9,494	3,165	
Danish	33	36	77	29	15	1					191	873,756	4,575	5,255
Ecuadorian	198	49									247	2,490	1,530	6,995
Egyptian														
Finnish		1									1	3,889	3,889	
French	2	12	7	(1)	25						107	728,525	6,809	7,195
German		4									4	11,660	2,915	6,740
Greek			6	97							103	729,676	7,084	2,798
Guatemalan														
Honduran	17	190	91	46	1	1					346	1,465,807	4,236	3,849
Icelandic	3										3	2,916	972	5,368
Irish														
Italian		2	3	34	29	2					70	550,258	7,861	7,984
Japanese			4	34	2						40	266,942	6,674	
Liberian	12		1	9	1						23	88,592	3,852	
Mexican											5	39,892	7,978	7,405
Netherland	25	25	5	25	21	13					114	633,517	5,557	5,421
Nicaraguan	8										8	8,909	1,114	2,195
Norwegian	39	126	206	123	8	11					513	2,529,223	4,931	5,172
Panamanian	22	50	11	96	3	38					220	1,368,814	6,292	6,370
Peruvian		19			1						20	72,885	3,629	4,094
Philippine		1	17	7							25	144,724	5,789	5,534
Portuguese	2		6	1							9	43,446	4,827	5,693
Soviet														5,058
Spanish		5	16	2							23	114,613	4,983	5,069
Swedish		29	38	74	4	1					148	801,700	5,417	5,486
Turkish	2													7,808
United States	11	66	183	996	668	278					2,202	16,900,402	7,675	7,967
Uruguay														6,302
Venezuelan		4	13								17	85,935	5,055	4,708
Total	440	677	880	2,143	960	416	19	9	18	10	5,572	36,032,450	6,467	6,856
Percent of total	7.9	12.2	15.8	38.5	17.3	7.5	0.3	0.1	0.3	0.1	100			

¹ Includes only toll-paying vessels of 300 net tons or over, Panama Canal measurement.² 21 vessels rated on displacement tonnage (8 British, 1 French, 4 Mexican, 1 Netherlands, 6 Peruvian, 1 United States) are not included.

TABLE No. 36.—*Principal commodities shipped through Canal*

[All figures in long tons of 2,240 pounds]

Commodity	Fiscal year		
	1951	1950	1949
ATLANTIC TO PACIFIC			
Mineral oils.....	1,758,830	1,418,655	2,186,777
Manufactures of iron and steel.....	1,600,434	1,286,790	1,163,779
Coal and coke.....	866,905	339,452	1,173,893
Phosphates.....	502,091	508,449	39,896
Paper and paper products.....	370,488	392,734	393,757
Cotton, raw.....	361,715	242,977	247,931
Sugar.....	353,726	186,199	60,228
Soy beans and flour.....	326,351	55,672	75,658
Sulphur.....	296,418	346,015	293,626
Automobiles and parts.....	286,220	204,447	182,739
Machinery.....	222,916	215,884	226,429
Metals, various.....	221,309	92,066	319,386
Tinplate.....	217,623	210,331	218,300
Ammonium compounds.....	209,644	864,919	448,652
Cement.....	174,316	168,830	84,638
Chemicals, unclassified.....	142,260	120,677	125,482
Canned food products.....	130,028	123,834	116,301
Fertilizers, unclassified.....	117,451	84,029	54,064
Coffee.....	100,791	76,819	93,912
Grains, unclassified.....	92,650	42,910	69,726
Creosote.....	86,993	40,089	34,907
Liquors and wines.....	82,050	62,291	42,209
Wood pulp.....	80,053	98,875	57,676
Wheat.....	74,327	70,681	75,262
Groceries, miscellaneous.....	73,294	65,347	24,504
Ores, various.....	71,122	113,282	65,423
Textiles.....	70,874	64,730	55,487
Salt.....	69,556	73,571	58,326
Agricultural implements.....	63,142	53,505	55,589
Electrical apparatus.....	62,969	53,307	38,653
Floor coverings.....	32,913	48,999	34,705
Flour, wheat.....	62,173	58,739	307,741
Slag.....	52,011	41,841	26,569
Glass and glassware.....	47,675	30,435	32,031
Asbestos.....	46,149	29,014	13,444
Lumber.....	45,880	37,004	41,503
Asphalt.....	39,243	42,825	73,408
Soda and sodium compounds.....	39,232	45,042	42,769
Paints and varnishes.....	31,430	28,836	30,591
Bricks and tile.....	31,157	20,190	18,895
Tobacco.....	30,117	40,466	36,834
Wax, paraffin.....	26,861	27,398	23,581
Rice.....	25,835	43,818	69,655
Pharmaceutical products.....	24,629	19,360	12,781
Rosin.....	24,000	30,295	19,699
Vegetable oils, misc.....	20,971	23,946	5,402
All others.....	1,435,650	1,238,288	1,023,380
Total.....	11,132,472	9,483,863	9,899,088

TABLE NO. 36.—*Principal commodities shipped through Canal—Con.*

[All figures in long tons of 2,240 pounds]

Commodity	Fiscal year		
	1951	1950	1949
PACIFIC TO ATLANTIC			
Ores, various	3,722,308	3,461,598	4,028,279
Lumber	3,574,602	2,863,412	2,005,669
Mineral oils	1,663,808	3,425,181	314,527
Wheat	1,403,575	1,516,235	1,127,581
Nitrate	1,371,191	1,485,745	1,445,982
Canned food products	1,163,575	1,148,027	751,385
Sugar	941,266	843,660	668,994
Metals, various	632,498	552,472	655,312
Bananas	504,926	496,011	480,542
Food products in refrigeration ¹	462,120	560,087	601,617
Copra	259,206	202,485	216,854
Coffee	218,783	230,790	261,870
Wool	208,758	247,421	228,302
Iron and steel manufactures	193,455	105,361	143,409
Cotton, raw	149,286	169,012	123,025
Rice	141,281	161,043	78,240
Fruit, fresh (excluding bananas)	140,152	124,419	81,724
Borax	129,615	79,312	61,546
Fruit, dried	127,107	167,474	144,091
Barley	121,714	60,841	69,621
Wood pulp	117,815	102,664	137,998
Flour, wheat	107,474	32,127	133,891
Scrap metal	106,942	128,214	334,615
Oils, vegetable	102,077	78,077	89,386
Beans, edible	99,369	78,896	85,910
Rubber, crude	75,573	49,398	69,785
Paper and paper products	69,585	65,065	56,908
Oilseeds (includes oilseed cake and meal)	47,416	82,847	60,256
Coconuts	45,392	33,966	34,183
Machinery	38,891	28,002	25,012
Skins and hides	38,773	54,396	43,095
Grains, miscellaneous and unclassified	36,952	37,319	32,616
Tallow	35,642	45,157	36,275
Peas, dry	35,421	17,770	40,745
Groceries, miscellaneous	33,852	28,542	16,220
Whale oil	33,702	-----	14,745
Hemp, unmanufactured	31,494	22,482	17,963
Chemicals, unclassified	30,783	23,249	30,226
Porcelainware	29,294	19,984	15,327
Seeds (except oilseeds)	27,652	29,781	32,928
Wines	26,090	29,994	18,432
Cocoa and cacao beans	25,823	20,466	19,079
Oats	22,715	24,855	30,087
Soda and sodium compounds	22,713	1,085	16,905
Molasses	22,434	10,259	50,339
Sand	22,418	6,829	17,902
Vegetables, dry	18,172	24,716	9,876
Textiles	16,184	10,639	5,928
Fish oil	12,328	4,735	5,671
Fertilizers, unclassified	7,953	13,926	21,226
All other	470,395	382,404	413,971
Total	18,940,550	19,388,430	15,406,070

¹ Does not include fresh fruit.

TABLE No. 37.—Origin and destination of cargo through the Panama Canal from Atlantic to Pacific during fiscal year 1951 segregated by countries in principal trade areas

From—	To west coast North America					To west coast South America							
	United States	Canada	Central America/ Mexico	Balboa, Canal Zone ¹	Hawaiian Islands	Total	Chile	Colombia	Ecuador	Peru	Argentina, Uruguay, Brazil ²	South America ²	Total
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
East coast North America:													
United States:													
North Atlantic ports	1,665,983	2,662	39,539	1,214	147,753	1,857,151	241,702	93,676	50,294	123,458	19,235	528,365	
South Atlantic ports	45,388			2	4,430	49,840	475	1,797	498	3,007	37	3,007	
Gulf ports	349,391	43,221	9,125	18,528	48,268	408,533	116,764	16,922	23,221	89,479	12,581	258,979	
Total, United States	2,060,762	45,883	48,664	19,744	200,471	2,375,524	358,941	112,385	74,016	213,137	31,853	790,342	
Canada	40,469	25,363		389		66,221	11,860	10,466	1,915	1,182		25,423	
Central America/Mexico	2,545	6,178	36,165	798		45,686			208			318	
Cristobal, C. Z.	730		99,856			100,586	935	2,084	658	1,867	38	6,918	
West Indies	9,043	7,182	201,828	129,471		347,524	646,099	1,251	3	15,882	24	50,811	
Total, North America	2,113,549	84,666	386,513	150,402	200,471	2,935,541	1,017,835	126,306	76,800	232,068	62	89,582	
Europe:													
British Isles	87,600	152,507	2,600	1,717	1	244,425	52,730	6,109	11,219	57,250		4,709	
Belgium	94,621	17,757	9,364	730		122,472	39,985	23,817	11,087	53,954		4,898	
Denmark	6,602	2,438	4,924			13,964	1,701	324	268	945		3	
France	21,063	1,630	503	4		23,530	2,997	111	340	1,210		3	
Germany	38,639	823	27,070	2,355		68,887	15,610	5,415	6,461	14,152		5,402	
Italy	14,796	2,597	23,095		24	40,512	792	206	235	1,935		829	
Netherlands	117,680	5,993	139	62		123,874	7,649	3,599	1,512	8,506		678	
Norway	50,811	201				51,012	6,550	527	207	3,645		248	
Spain and Portugal	3,135	414	83			3,632	1,175	53	82	701		248	
Sweden	33,033	473	7,472			42,988	19,551	4,660	2,156	9,191		2,429	
Europe, other ³	178,928	52,636	39,455	250		270,669	24,558	7,479	6,473	24,756		26,895	
Total, Europe	618,948	237,169	114,705	5,118	25	1,005,965	173,298	52,300	40,040	176,248		47,000	
East coast South America:													
Argentina	31,012	1,734				32,778							3,070
Brazil	87,796	20,125	85	32		108,006	198	40	4	3,026		19	217
Colombia	8,212	11,567	34			19,843		24,810		463		51	25,273
Venezuela	4,565		3,607			35,981	11,615			76		89	11,742
South America, other ³	22,234	4,644				26,878	7		2,961	5,261			8,318
Total, South America	153,879	38,248	27,720	3,639		223,486	11,820	24,850	2,965	8,826		159	48,620
Asia	11,555					11,555							
Africa	12,901					25,412	6,618	9,593					16,121
Grand total	2,940,832	572,534	528,938	159,159	200,496	4,201,959	1,209,571	212,959	119,805	417,142	62	136,741	2,096,280
Percent Pacific-bound cargo	26.4	3.3	4.8	1.4	1.8	37.7	10.9	1.9	1.2	3.7		1.2	18.9

¹ Includes both local and transhipped cargo.² Cargo not routed to permit segregation between definite countries.³ Also includes cargo not routed to permit segregation between definite countries.⁴ Via Strait of Magellan.

TABLE No. 37.—Origin and destination of cargo through the Panama Canal from Atlantic to Pacific during fiscal year 1951 segregated by countries in principal trade areas—Continued

From—	To Australasia				To Asia					Grand total	Percent of total Pacific-bound cargo
	Australia	New Zealand	Australasia (other) ²	Total	Philippine Islands	China	Japan	East Indies	Asia (other) ²	Total	
East coast North America:											
United States:											
North Atlantic ports.....	Tons 194,405	Tons 46,002	Tons 6,038	Tons 246,445	Tons 180,368	Tons 36,954	Tons 1,026,048	Tons 35,883	Tons 139,382	Tons 1,427,635	36.4
South Atlantic ports.....	1,935	1,840	3,775	6,549	10,241	3,329	56,911	743	5,811	74,038	1.2
Gulf ports.....	198,852	93,781	608	293,241	92,910	43,272	1,219,720	8,068	69,449	1,433,425	22.0
Total, United States.....	395,192	141,623	6,646	543,461	292,528	80,555	2,302,679	44,694	214,642	2,935,098	59.6
Canada.....	29,273	43,338	—	72,631	1,013	2,953	70,327	1,373	993	76,629	2.2
Central America/Mexico.....	—	—	—	—	—	—	—	—	—	—	—
Cristobal, C. Z. ¹	—	—	—	—	—	—	—	—	—	—	—
West Indies.....	49,365	15,636	361	65,362	—	44,999	267,400	—	2,886	315,235	1.0
Total, North America.....	473,830	200,617	7,007	681,454	293,541	128,537	2,640,406	46,067	218,411	3,326,962	76.2
Europe:											
British Isles.....	27,177	557,779	27,144	612,100	1,372	1,987	1,414	—	161	4,934	8.9
Belgium.....	5,067	87,980	500	93,547	1,321	5,082	16,956	—	1,705	25,064	3.4
Denmark.....	—	—	—	—	—	—	—	—	—	—	—
France.....	2,650	323	16,011	18,984	—	—	—	—	—	—	—
Germany.....	3,640	—	—	3,640	—	—	104	136	—	376	1.1
Italy.....	—	—	—	—	124	2	—	—	10	—	—
Netherlands.....	904	4,009	—	4,913	—	—	—	—	—	—	—
Norway.....	1,276	1,981	1,232	4,489	—	—	—	—	—	—	—
Spain and Portugal.....	617	143	—	760	—	—	—	—	—	—	—
Sweden.....	4,047	5,965	1,300	11,312	—	—	—	—	—	—	—
Europe, other ²	607	10,070	4,225	14,902	—	1,108	1,050	—	272	2,430	—
Total, Europe.....	45,985	698,250	50,412	794,647	2,817	8,179	19,524	136	2,148	32,804	3.4
East coast South America:											
Argentina.....	—	—	—	—	—	—	—	—	—	—	—
Brazil.....	—	—	—	—	—	—	13,373	—	—	13,373	—
Colombia.....	—	—	—	—	—	—	12,912	—	—	12,912	—
Venezuela.....	—	—	—	—	—	—	—	—	—	—	—
South America, other ²	—	—	—	—	—	—	—	—	—	—	—
Total, South America.....	—	—	—	—	—	—	26,285	—	—	26,285	—
Asia.....	—	—	—	—	—	—	—	—	—	—	—
Africa.....	604	—	1,477	2,081	—	—	—	—	—	—	—
Grand total.....	520,419	868,867	58,896	1,448,182	296,358	136,716	2,686,215	46,203	220,559	3,386,051	100.0
Percent of Pacific-bound cargo.....	4.7	7.8	0.5	13.0	2.7	1.2	24.1	0.4	2.0	30.4	—

¹ Includes both local and transhipped cargo.² Also includes cargo not routed to permit segregation between definite countries.

TABLE No. 38.—Origin and destination of cargo through Panama Canal from Pacific to Atlantic during fiscal year 1951 segregated by countries in principal trade areas

From—	To United States				To other North America				Total North America
	North Atlantic ports	South Atlantic ports	Gulf Ports	Total	Canada	Central America/Mexico	Cristobal Canal Zone ¹	West Indies	
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
West coast North America:									
United States:	3,490,411	28,454	151,026	3,669,891	9,338	3,190	88,114	339,352	4,110,085
Canada:	537,001	7,278	3,000	547,279	13,939	---	604	22,470	586,381
Central America/Mexico:	218,066	485	121,633	340,184	821	1,625	73,336	9,024	436,250
Hawaiian Islands:	457,610	6,737	44,611	508,958	---	5,245	208	---	514,411
Total, North America:	4,703,088	42,954	320,270	5,066,312	26,318	10,060	162,582	370,855	5,636,127
West coast South America:									
Chile:	3,283,173	200,941	255,928	3,740,042	---	---	4,533	31,057	3,775,692
Colombia:	85,417	7,461	33,914	126,792	---	---	2,798	59	129,958
Ecuador:	91,659	28,334	88,754	208,747	309	---	19,831	4,776	233,359
Peru:	89,111	2,864	44,169	136,144	---	5	3,101	29	139,274
South America ² :	36,056	---	25,213	61,269	---	---	1,782	12	63,063
Total, South America:	3,585,416	239,600	447,978	4,272,994	309	5	32,105	35,933	4,341,346
Australasia:									
Australia:	135,722	---	---	135,722	---	---	---	---	135,722
New Zealand:	39,725	---	---	40,846	---	---	---	---	40,846
Australasia, other ³ :	53,671	---	1,123	53,671	---	---	---	---	53,671
Total, Australasia:	229,116	---	1,123	230,239	---	---	---	---	230,239
Asia:									
Philippine Islands:	1,003,302	4,204	153,472	1,160,978	---	---	---	---	1,160,978
China:	49,907	2	33	49,962	---	---	1,961	---	50,671
Japan:	296,833	88	23,595	320,516	---	---	7,616	289	328,421
East Indies:	12,089	---	263,898	275,987	---	---	---	18,028	294,015
Asia, other ³ :	87,314	---	70,074	157,388	---	---	3,416	1,116	162,380
Total, Asia:	1,449,445	4,294	511,092	1,964,831	---	---	---	19,459	1,984,290
Grand total:	9,967,065	286,848	1,280,463	11,534,376	142,741	10,525	210,569	453,650	12,351,861
Percent of Atlantic-bound cargo:	52.6	1.5	6.8	60.9	0.8	0.1	1.1	2.4	65.3

¹ Includes both local and transshipped cargo.² Cargo not routed to permit segregation between definite countries.³ Also includes cargo not routed to permit segregation between definite countries.

From—	To South America						To Africa					Grand total	Percent of total Atlantic-bound cargo
	Argentina	Brazil	Colombia	Venezuela	South America (other) ²	Total	Asia	British South Africa	Egypt	Africa (other) ²	Total		
West coast North America:													
United States.....	Tons 16,353	Tons 64,298	Tons 18,705	Tons 50,230	Tons 34,749	Tons 184,295	Tons 138,723	Tons 59,654	Tons 44,243	Tons 53,473	Tons 157,370	Tons 5,917,657	
Canada.....	745	3,373	30,800	5,758	7,656	48,332	22,631	324,065		46,171	370,176	2,910,246	
Central America/Mexico.....				4,348		4,348	270					408,683	
Hawaiian Islands.....												514,411	
Total, North America.....	17,098	67,581	49,505	69,336	42,455	236,975	161,624	383,659	44,243	99,644	527,546	9,810,997	
West coast South America:													
Chile.....		6,466	7	666		7,139	13,000	10,000	272,874		282,874	4,781,283	
Colombia.....			14,894			14,894	9,758					167,466	
Ecuador.....	34		3,113	4,161	1,702	9,070						274,751	
Peru.....			43	16,559	5,031	21,633						539,484	
South America ²			135	95		230				2,833	2,833	93,116	
Total, South America.....	34	6,466	18,192	21,481	6,733	52,966	22,758	10,000	272,874	2,833	285,707	5,836,100	
Australasia:													
Australia.....												323,610	
New Zealand.....												686,556	
Australasia, other ²				2,300		2,300						214,223	
Total, Australasia.....				2,300		2,300						1,224,389	
Asia:													
Philippine Islands.....			29,550	10,015		39,565						1,202,504	
China.....							72			13	13	50,756	
Japan.....					6,200	6,200						334,791	
East Indies.....												294,015	
Asia (other) ²												166,998	
Total, Asia.....			29,550	10,015	6,200	45,765	72			13	13	2,049,064	
Grand total.....	17,132	74,047	97,247	94,132	55,448	338,006	184,454	393,659	317,117	102,490	813,266	18,940,550	
Percent of Atlantic-bound cargo.....	0.1	0.4	0.5	0.5	0.3	1.8	0.9	2.1	1.7	6.5	4.3	100.0	

² Cargo not routed to permit segregation between definite countries.

³ Also includes cargo not routed to permit segregation between definite countries.

TABLE No. 39.—*Cargo shipments by trade route—Atlantic to Pacific*

[Tons of 2,240 pounds]

	Fiscal year		
	1951	1950	1949
East coast United States to:			
West coast United States.....	2,060,762	1,846,324	1,449,561
West coast Canada.....	45,883	34,674	37,350
West coast Central America/Mexico.....	48,664	42,691	62,644
West coast South America.....	790,342	774,054	860,376
Hawaiian Islands.....	200,471	247,082	267,658
Australasia.....	543,461	577,144	759,498
Asia.....	2,935,098	2,718,064	3,100,599
Balboa, C. Z.....	19,744	7,899	25,905
Total from east coast United States.....	6,644,425	6,247,932	6,563,591
East coast Canada to:			
West coast United States.....	40,469	42,822	35,670
West coast Canada.....	25,363	25,137	2,900
Australasia.....	72,631	98,571	111,157
Asia.....	76,629	16,663	33,683
West coast South America.....	25,423	1,799	4,772
Other territories.....	389	84	324
Total from east coast Canada.....	240,904	185,076	188,506
East coast Central America/Mexico to:			
West coast Central America/Mexico.....	36,165	93,183	162,365
Asia.....		20,554	11,275
Other territories.....	9,839	5,592	4,825
Total from east coast Central America/Mexico.....	46,004	119,329	178,465
East coast South America to:			
West coast United States.....	153,879	122,249	275,078
West coast Canada.....	38,248	22,109	27,972
West coast South America.....	48,620	57,665	65,208
Australasia.....		1,044	30,415
Asia.....	26,285		9,169
Central America/Mexico.....	27,720	21	23
Other territories.....	3,639	51	17
Total from east coast South America.....	298,391	203,139	407,882
Cristobal, C. Z., to:			
West coast Central America/Mexico.....	99,856	64,687	80,189
West coast South America.....	12,500	7,244	18,153
Other territories.....	730	1,321	7,604
Total from Cristobal, C. Z.....	113,086	73,252	105,946
West Indies to:			
West coast United States.....	9,043	79,979	6,090
West coast Central America/Mexico.....	201,828	106,630	172,237
West coast South America.....	714,070	519,601	752,264
Balboa, C. Z.....	129,471	150,513	184,152
Australasia.....	65,362	71,357	84,746
Asia.....	315,235	85,206	47,634
West coast Canada.....	7,182	19,470	8,903
Total from West Indies.....	1,442,191	1,032,756	1,256,026
Europe to:			
West coast United States.....	648,948	315,386	233,570
West coast Canada.....	237,169	117,812	75,795
West coast Central America/Mexico.....	114,705	74,276	38,986
West coast South America.....	488,886	298,137	233,662
Australasia.....	764,647	722,310	554,437
Asia.....	32,804	70,565	22,717
Other territories.....	5,143	1,427	126
Total from Europe.....	2,292,302	1,599,913	1,159,293
Asia to:			
West coast United States.....	11,555	11,136	23,236
Other territories.....		3	55
Total from Asia.....	11,555	11,139	23,291
Africa to:			
West coast United States.....	12,901	4,878	5,348
West coast Canada.....	12,511	1,909	1,327
West coast South America.....	16,121	2,565	6,889
Other territories.....	2,081	1,975	2,524
Total from Africa.....	43,614	11,327	16,088
Total cargo—Atlantic to Pacific.....	11,132,472	9,483,863	9,899,088

TABLE No. 40.—*Cargo shipments by trade routes—Pacific to Atlantic*

[Tons of 2,240 pounds]

	Fiscal year		
	1951	1950	1949
West coast United States to:			
East coast United States.....	3,669,891	5,530,116	1,641,157
East coast Canada.....	9,538	32,481	11,475
East coast South America.....	181,295	88,485	83,170
Cristobal, C. Z.....	88,114	117,697	9,452
West Indies.....	339,352	268,575	177,974
Europe.....	1,327,184	806,263	791,491
Asia.....	138,723	107,403	3,423
Africa.....	157,370	115,831	117,803
Other territories.....	3,190	778	1,040
Total from west coast United States.....	5,917,657	7,067,630	2,839,985
West coast Canada to:			
East coast United States.....	547,279	599,185	171,880
East coast Canada.....	15,959	12,779	-----
East coast South America.....	48,332	17,807	13,441
West Indies.....	22,479	28,406	11,218
Europe.....	1,882,726	1,586,522	1,787,646
Asia.....	22,631	128,429	13,047
Africa.....	370,176	323,817	291,599
Other territories.....	664	10,072	9,661
Total from west coast Canada.....	2,910,245	2,707,047	2,298,492
West coast Central America/Mexico to:			
East coast United States.....	340,184	393,806	389,015
Cristobal, C. Z.....	73,596	61,170	59,121
Europe.....	38,815	73,649	51,299
West Indies.....	9,024	10,798	9,042
Other territories.....	7,064	23,247	9,717
Total from Central America/Mexico.....	468,683	562,670	518,194
West coast South America to:			
East coast United States.....	4,272,994	3,841,146	4,387,317
East coast South America.....	52,966	58,277	50,421
Cristobal, C. Z.....	32,105	15,203	26,726
West Indies.....	35,933	36,930	51,117
Europe.....	1,153,323	1,216,887	1,130,194
Africa.....	285,707	286,156	367,904
Asia.....	22,758	13,020	-----
All other territories.....	314	2,813	12,214
Total from west coast South America.....	5,856,100	5,500,162	6,025,923
Balboa, C. Z., to other territories.....	-----	4,557	8,373
Hawaiian Islands to:			
East coast United States.....	508,958	691,339	393,481
Other territories.....	5,453	1,892	11,479
Total from Hawaiian Islands.....	514,411	693,231	401,960
Australasia to:			
East coast United States.....	230,239	202,556	255,902
East coast Canada.....	116,114	87,615	89,558
West Indies.....	27,403	32,903	19,310
Europe.....	846,127	996,236	1,198,932
Other territories.....	4,506	7,962	2,624
Total from Australasia.....	1,224,389	1,327,272	1,566,326
Asia to:			
East coast United States.....	1,964,831	1,491,201	1,688,654
East coast Canada.....	-----	10,520	29,020
East coast South America.....	45,765	12,250	10,830
West Indies.....	19,459	109	29
Other territories.....	19,009	11,481	15,284
Total from Asia.....	2,049,064	1,525,561	1,743,817
Total cargo—Pacific to Atlantic.....	18,940,550	19,388,430	15,406,070

TABLE No. 41.—*Important commodity shipments over principal trade routes*

ATLANTIC TO PACIFIC

[Tons of 2,240 pounds]

	Fiscal year		
	1951	1950	1949
East coast United States to west coast United States:			
Canned food products.....	40,516	34,787	30,887
Chemicals, unclassified.....	33,084	32,587	20,928
Electric apparatus.....	31,055	22,943	9,275
Floor coverings.....	49,889	41,027	27,783
Groceries, unclassified.....	25,771	21,773	10,226
Iron and steel manufactures.....	841,075	681,666	630,704
Liquors.....	32,223	21,571	11,769
Machinery.....	25,620	18,292	13,688
Mineral oils:			
Lubricating.....	175,538	173,981	120,189
Other and unclassified.....	38,915	87,763	86,828
Paints.....	13,377	13,651	8,187
Paper and paper products.....	123,117	113,217	83,129
Pharmaceutical products.....	14,665	12,633	4,401
Sulphur.....	122,138	120,587	69,566
Textiles.....	17,731	10,232	4,287
Tinplate.....	16,556	23,943	12,549
Woodpulp.....	32,480	48,037	17,843
All other and unclassified.....	427,012	367,634	287,322
Total.....	2,060,762	1,846,324	1,449,561
East coast United States to west coast Canada:			
Sulphur.....	36,675	23,781	24,190
All other and unclassified.....	9,208	10,893	13,160
Total.....	45,883	34,674	37,350
East coast United States to west coast Central America/ Mexico:			
Chemicals, unclassified.....	8,136	6,669	12,902
Coal.....	7,181	11,705	14,161
Fertilizers, unclassified.....	10,111	6,351	6,816
Lime.....	12,523	5,622	4,034
Mineral oils.....	7	3,770	15,663
All other and unclassified.....	10,706	8,574	9,068
Total.....	48,664	42,691	62,644
East coast United States to west coast South America:			
Agricultural implements.....	12,715	13,132	21,067
Automobiles and parts.....	72,467	42,298	37,795
Bricks and tile.....	17,343	8,925	13,898
Canned food products.....	10,062	12,261	10,637
Cement.....	2,711	8,737	12,861
Chemicals, unclassified.....	14,994	14,778	23,102
Coal.....	111,415	78,122	4,336
Cotton, raw.....	14,800	10,611	18,385
Flour.....	41,224	24,233	33,317
Groceries, unclassified.....	14,794	5,567	2,133
Iron and steel manufactures.....	78,303	149,760	176,070
Machinery.....	56,820	67,654	90,340
Mineral oils:			
Lubricating oils.....	38,547	25,645	29,281
Other and unclassified.....	47,146	33,407	40,733
Paper and paper products.....	11,015	15,423	18,397
Tinplate.....	7,090	5,970	13,241
Wax, paraffin.....	15,429	16,730	14,642
Wheat.....	34,864	65,008	70,176
All other and unclassified.....	188,503	175,793	229,965
Total.....	790,342	774,054	860,376
East coast United States to Hawaiian Islands:			
Automobiles and parts.....	13,907	12,086	15,109
Canned food products.....	4,902	13,055	9,204
Chemicals, unclassified.....	7,045	4,738	5,228
Iron and steel manufactures.....	29,963	21,935	23,931
Mineral oils.....	177	9	16,057
Tinplate.....	55,752	62,217	79,319
Paper and paper products.....	11,237	10,033	9,214
All other and unclassified.....	77,488	123,009	109,596
Total.....	200,471	247,082	267,658

TABLE NO. 41.—*Important commodity shipments over principal trade routes—Con.*

ATLANTIC TO PACIFIC—Continued

[Tons of 2,240 pounds]

	Fiscal year		
	1951	1950	1949
East coast United States to Australasia:			
• Agricultural implements.....	28,251	23,097	17,814
Automobiles and parts.....	21,467	26,556	26,436
Carbon black.....	11,842	9,603	8,343
Chemicals, unclassified.....	5,367	3,675	6,698
Coal.....		19,724	82,837
Iron and steel manufactures.....	21,636	54,686	17,076
Machinery.....	22,156	21,802	17,693
Metals, miscellaneous.....	7,365	5,555	5,792
Mineral oils:			
Lubricating.....	126,741	110,020	91,207
Other and unclassified.....	18,850	6,048	149,092
Rosin.....	6,770	6,868	5,749
Sulphur.....	131,259	172,858	192,435
Sugar.....	9,708	218	126
Tinplate.....	54,921	43,288	54,450
Tobacco and manufactures.....	14,399	13,794	12,099
All other and unclassified.....	53,729	59,352	71,651
Total.....	543,461	577,144	759,498
East coast United States to Asia:			
Ammonium compounds.....	158,492	826,726	432,547
Asbestos.....	8,787	2,481	914
Automobiles and parts.....	40,321	32,796	34,589
Canned food products.....	41,491	31,704	45,650
Chemicals, unclassified.....	14,164	19,230	15,556
Coal.....	735,861	217,652	1,025,745
Corn.....	37,989	15,400	6,496
Cotton, raw.....	323,830	224,308	225,265
Electrical apparatus.....	7,315	6,766	8,831
Fertilizers, unclassified.....	46,946	33,210	34,355
Flour.....	9,875	26,669	262,461
Glass and glassware.....	6,525	5,431	6,635
Iron and steel manufactures.....	68,761	107,170	99,642
Groceries, unclassified.....	9,229	16,537	6,781
Machinery.....	27,537	26,532	37,563
Metals, various.....	14,032	18,237	13,767
Mineral oils:			
Lubricating.....	91,679	69,061	91,360
Other and unclassified.....	75,436	16,842	46,364
Paper and paper products.....	25,028	29,974	31,212
Phosphates.....	465,249	483,359	17,686
Rice.....	221	38,263	58,168
Rosin.....	8,009	11,100	7,394
Soy beans and products.....	293,602	53,332	74,241
Soda and sodium compounds.....	6,372	17,309	299
Sugar.....	10,891	2,416	1,554
Sulphur.....	1,409	19,664	5,990
Textiles.....	18,221	20,206	18,927
Tinplate.....	41,734	40,509	27,986
Tobacco.....	12,511	23,477	20,815
Wax, paraffin.....	6,462	7,734	6,305
Wheat.....	9,632	5,661	4,666
All other and unclassified.....	317,484	268,302	430,838
Total.....	2,935,098	2,718,064	3,100,599
East coast United States to Balboa, C. Z.:			
Mineral oils.....	16,539	4,799	19,261
All other and unclassified.....	3,205	3,100	6,644
Total.....	19,744	7,899	25,905
East coast Canada to west coast United States:			
Asbestos.....	8,552	6,850	-----
Copper and lead concentrates.....	8,840	24,259	30,704
Metals, unclassified.....	11,264	73	-----
Paper.....	11,651	10,427	4,835
All other and unclassified.....	162	1,213	131
Total.....	40,469	42,822	35,670

TABLE NO. 41.—*Important commodity shipments over principal trade routes—Con.*

ATLANTIC TO PACIFIC—Continued

[Tons of 2,240 pounds]

	Fiscal year		
	1951	1950	1949
East coast Canada to west coast Canada. (No single outstanding commodity in this trade.)			*
East coast Canada to Australasia:			
Asbestos.....	11,541	7,297	4,425
Automobiles and parts.....	8,822	7,777	9,969
Paper and paper products.....	23,578	57,653	59,263
Wheat.....	9,875		
All other and unclassified.....	18,815	25,844	37,500
Total.....	72,631	98,571	111,157
East coast Canada to Asia:			
Asbestos.....	5,552	1,259	134
Grain, unclassified.....	10,192	393	
Iron and steel manufactures.....	209	791	10,808
Soybean products.....	28,533		
Wheat.....	18,089		
All other and unclassified.....	14,054	14,220	22,741
Total.....	76,629	16,663	33,683
East coast Canada to west coast South America:			
Flour.....	7,095		
Grain, unclassified.....	9,744		
All other and unclassified.....	8,584		
Total.....	25,423	1,799	4,772
East coast Central America/Mexico to west coast Central America/Mexico:			
Mineral oils.....	34,279	89,692	160,228
All other and unclassified.....	1,886	3,491	2,137
Total.....	36,165	93,183	162,365
East coast Central America/Mexico to Asia:			
Sugar.....		18,554	
All other and unclassified.....		2,000	11,275
Total.....		20,554	11,275
East coast South America to west coast United States:			
Bones and bonemeal.....	9,458	5,202	4,144
Canned meat.....	16,214	8,406	11,445
Coffee.....	80,349	60,314	74,689
Fertilizers, miscellaneous.....	6,704	4,515	1,124
Lumber.....	8,101	99	164
Mineral oils.....			128,690
Ores, unclassified.....	7,258	3,568	5
All other and unclassified.....	25,795	40,145	54,817
Total.....	153,879	122,249	275,078
East coast South America to west coast Canada:			
Coffee.....	14,242	7,955	9,376
Minerals oils.....	11,513	10,860	15,381
Rice.....	8,872		
All other and unclassified.....	3,621	3,294	3,215
Total.....	38,248	22,109	27,972
East coast South America to west coast South America:			
Lumber.....	7,965	7,039	12,259
Mineral oils.....	18,790	31,153	28,339
Salt.....	6,445	6,406	5,528
All other and unclassified.....	15,420	13,067	19,082
Total.....	48,620	57,665	65,208
East coast South America to Australasia. (No single outstanding commodity in this trade.)			
East coast South America to Asia:			
Cotton.....	15,487		
Oilseeds.....	9,900		
All other and unclassified.....	898		9,169
Total.....	26,285		9,169

TABLE NO. 41.—*Important commodity shipments over principal trade routes—Con.*

ATLANTIC TO PACIFIC—Continued

[Tons of 2,240 pounds]

	Fiscal year		
	1951	1950	1949
East coast South America to west coast Central America/Mexico:			
Mineral oils.....	27,601		
All other and unclassified.....	119	21	23
Total.....	27,720	21	23
Cristobal, C. Z., to west coast Central America/Mexico. (No single outstanding commodity in this trade.)			
Cristobal, C. Z., to west coast South America. (No single outstanding commodity in this trade.)			
West Indies to west coast United States:			
Molasses.....		33,644	
Sugar.....		34,476	4,000
Ores, miscellaneous.....	6,002		
All other and unclassified.....	3,041	11,859	2,090
Total.....	9,043	79,979	6,090
West Indies to west coast Central America/Mexico:			
Asphalt.....	2,217	1,679	20,425
Mineral oils.....	195,940	104,951	149,590
All other and unclassified.....	3,671		2,222
Total.....	201,828	106,630	172,237
West Indies to west coast South America:			
Mineral oils.....	667,659	443,346	704,174
Sugar.....	39,967	72,913	44,310
All other and unclassified.....	6,444	3,342	3,780
Total.....	714,070	519,601	752,264
West Indies to Balboa, C. Z.:			
Mineral oils.....	129,429	150,446	171,729
All other and unclassified.....	42	67	12,423
Total.....	129,471	150,513	184,152
West Indies to Australasia:			
Asphalt.....	27,852	29,782	¹ 21,263
Mineral oils.....	35,377	37,306	45,352
All other and unclassified.....	2,133	4,299	15,131
Total.....	65,362	71,387	81,746
West Indies to Asia:			
Mineral oils.....		11,000	15,965
Salt.....	34,400	42,852	23,415
Sugar.....	280,773	31,317	
All other and unclassified.....	62	7	8,254
Total.....	315,235	85,206	47,634
West Indies to west coast Canada:			
Sugar.....	6,990	14,000	4,000
All other and unclassified.....	192	5,470	4,903
Total.....	7,182	19,470	8,903

¹ Corrected figure.

TABLE NO. 41.—*Important commodity shipments over principal trade routes—Con.*

ATLANTIC TO PACIFIC—Continued

[Tons of 2,240 pounds]

	Fiscal year		
	1951	1950	1949
Europe to west coast United States:			
Ammonium compounds.....	23,301	10,663	72
Automobiles and parts.....	10,605	5,171	5,454
Chemicals, unclassified.....	6,363	1,778	4,215
Clay.....	6,559	2,883	626
Creosote.....	47,342	24,336	22,007
Fertilizers, unclassified.....	33,428	12,002	20
Glass and glassware.....	15,352	4,534	1,244
Iron and steel manufactures.....	141,758	24,117	8,808
Liquors and wines.....	17,488	11,978	7,476
Metal, iron.....	74,313	14,889	2,004
Ores:			
Copper.....	9,800	47,827	—
Other and unclassified.....	12,971	10,644	200
Paper and paper products.....	88,379	82,308	125,704
Sand.....	11,686	2,900	9,112
Scrap metal.....	39,566	—	—
Woodpulp.....	15,051	7,975	1,850
All other and unclassified.....	96,986	51,381	44,778
Total.....	648,948	315,386	233,570
Europe to west coast Canada:			
Automobiles and parts.....	23,526	20,322	7,752
Chemicals, unclassified.....	5,045	2,591	991
Creosote.....	35,120	15,042	12,660
Glass and glassware.....	8,643	6,847	6,154
Iron and steel manufactures.....	101,543	34,343	17,139
Liquors and wines.....	6,727	8,158	6,088
Ores, various.....	9,439	33	31
All other and unclassified.....	47,126	30,476	24,980
Total.....	237,169	117,812	75,795
Europe to west coast Central America/Mexico:			
Cement.....	68,844	57,822	28,546
Iron and steel manufactures.....	16,345	3,438	3,329
All other and unclassified.....	29,516	13,016	7,111
Total.....	114,705	74,276	38,986
Europe to west coast South America:			
Ammonium compounds.....	11,189	2,611	2,871
Automobiles and parts.....	9,060	4,306	2,661
Cement.....	6,577	3,216	17,112
Chemicals, unclassified.....	25,210	10,841	15,398
Electrical apparatus.....	5,180	2,985	2,590
Groceries, unclassified.....	6,312	956	232
Iron and steel manufactures.....	170,991	76,230	57,860
Machinery.....	24,682	20,682	16,011
Metal, iron.....	6,781	5,406	4,963
Paper and paper products.....	40,086	38,718	21,414
Soda and sodium compounds.....	12,969	6,900	203
Textiles.....	7,098	4,384	3,338
Woodpulp.....	16,774	26,615	17,838
All other and unclassified.....	145,974	94,287	71,171
Total.....	488,886	298,137	233,662

TABLE NO. 41.—*Important commodity shipments over principal trade routes—Con.*

ATLANTIC TO PACIFIC—Continued

[Tons of 2,240 pounds]

	Fiscal year		
	1951	1950	1949
Europe to Australasia:			
Agricultural implements.....	12,560	7,259	8,268
Ammonium compounds.....	8,530	12,288	1,670
Automobiles and parts.....	76,081	46,651	35,532
Cement.....	83,021	86,732	11,156
Chemicals, unclassified.....	15,612	18,860	12,461
Coal.....			34,175
Electrical apparatus.....	8,562	9,398	6,351
Fertilizers, unclassified.....	6,148	5,048	682
Floor coverings.....	10,150	5,619	3,748
Glass and glassware.....	7,510	5,857	7,607
Iron and steel manufactures.....	104,037	113,896	97,190
Liquors and wines.....	9,457	6,481	4,898
Lumber.....	7,902	8,030	9,830
Machinery.....	53,926	51,339	29,846
Metal, iron.....	10,921	1,377	6,853
Paper and paper products.....	25,188	26,071	21,737
Phosphates.....	9,600	1,773	2,500
Salt.....	28,500	23,801	25,006
Slag.....	52,009	40,841	26,469
Soda and sodium compounds.....	10,300	11,328	270
Textiles.....	21,575	25,439	20,579
Tinplate.....	40,750	32,181	29,197
Woodpulp.....	6,932	8,403	14,647
All other and unclassified.....	155,376	173,638	143,762
Total.....	764,647	722,310	554,437
Europe to Asia:			
Iron and steel manufactures.....	7,873	1,157	2,51
Potash.....	9,290	42,790	8,733
All other and unclassified.....	15,641	26,618	11,474
Total.....	32,804	70,565	22,717
Asia to west coast United States:			
Ore, copper.....	9,800		17,875
All other and unclassified.....	1,755	11,136	5,361
Total.....	11,555	11,136	23,236
Africa to west coast United States:			
Metal, iron.....	10,184		
All other and unclassified.....	2,717	4,878	5,348
Total.....	12,901	4,878	5,348
Africa to west coast Canada:			
Ore, chrome.....	9,310		
All other and unclassified.....	3,201	1,909	1,327
Total.....	12,511	1,909	1,327
Africa to west coast South America:			
Rice.....	9,503		
All other and unclassified.....	6,618	2,565	6,889
Total.....	16,121	2,565	6,889

TABLE NO. 42.—*Important commodity shipments over principal trade routes*

PACIFIC TO ATLANTIC

[Tons of 2,240 pounds]

	Fiscal year		
	1951	1950	1949
West coast United States to east coast United States:			
Beans, edible, dry	16,929	12,085	2,546
Canned food products	534,959	551,860	313,041
Chemicals, unclassified	9,207	8,483	6,792
Fruits, dried	54,660	52,110	18,653
Groceries, unclassified	7,211	6,116	6,020
Iron and steel manufactures	16,633	16,000	42,628
Lumber	1,365,195	1,441,803	853,780
Machinery	6,823	6,257	5,910
Mineral oils	1,374,775	3,115,328	129,195
Molasses	20	10,259	20,375
Ore, magnesite	17,100	13,683	29,575
Paper and paper products	38,983	45,582	28,206
Rice	9,883	14,291	4,000
Wood pulp	41,356	66,018	41,907
Wines	16,542	14,345	2,871
Wool	6,168	10,247	7,920
Borax	10,740	9,398	1,603
Scrap metal	10,111	332	1,291
Metals, various	19,012	15,579	6,461
Soda and sodium compounds	9,645	17	
All other and unclassified	103,939	120,323	118,383
Total	3,669,891	5,530,116	1,641,157
West coast United States to east coast Canada:			
Lumber	9,416	1,500	
Mineral oils		30,981	11,443
All other and unclassified	122		32
Total	9,538	32,481	11,475
West coast United States to east coast South America:			
Canned food products	24,234	24,075	10,723
Iron and steel manufactures	12,399	11,130	7,617
Lumber	9,177	3,097	5,459
Machinery	7,148	6,955	5,639
Paper	6,675	3,543	4,154
Soda and sodium compounds	11,723	550	
Wheat	22,745		97
All other and unclassified	90,194	39,135	49,481
Total	184,295	88,485	83,170
West coast United States to Cristobal, C. Z.:			
Mineral oils	75,812	113,440	218
All other and unclassified	12,302	4,257	9,234
Total	88,114	117,697	9,452
West coast United States to West Indies:			
Beans, edible	23,436	27,126	17,630
Canned food products	99,105	76,809	49,772
Iron and steel manufactures	10,339	4,128	3,729
Lumber	42,014	15,550	9,849
Mineral oils	196	182	17,257
Paper and paper products	11,499	8,251	3,823
Rice	84,018	85,411	47,792
All other and unclassified	68,745	51,119	28,122
Total	339,352	268,576	177,974
West coast United States to Europe:			
Barley	66,072	17,473	19,207
Beans, edible, dry	17,620	1,286	5,204
Borax	111,373	64,218	57,933
Canned food products	45,214	50,242	53,624
Chemicals, unclassified	8,012	7,958	8,581
Cotton, raw	68,262	112,068	81,238
Flour	16,696	13,994	69,355
Fruit, dried	45,404	94,732	107,329
Fruit, fresh	82,934	48,085	36,467
Iron and steel manufactures	7,617	4,925	70,077
Lumber	304,585	151,275	61,986
Machinery	6,186	5,781	6,211

TABLE NO. 42.—*Important commodity shipments over principal trade routes—Con.*

PACIFIC TO ATLANTIC—Continued

[Tons of 2,240 pounds]

	Fiscal year		
	1951	1950	1949
West coast United States to Europe—Continued			
Metals:			
Copper.....	19,197	25,714	24,442
Other and unclassified.....	4,128	7,319	17,152
Mineral oils.....	25,698	1,625	1,609
Peas, dry.....	12,980	960	13,410
Rice.....	7,399	9,569	2,236
Wheat.....	379,699	121,131	306
Wood pulp.....	20,982	9,738	42,477
All other and unclassified.....	77,126	58,170	115,647
Total.....	1,327,184	806,263	791,491
West coast United States to Asia:			
Iron and steel manufactures.....	62,050	62,990	165
Lumber.....	34,161	25,400	433
Wheat.....	29,250		
All other and unclassified.....	13,262	19,013	2,825
Total.....	138,723	107,403	3,423
West coast United States to Africa:			
Iron and steel manufactures.....	12,013	1,318	7,045
Lumber.....	67,668	82,858	38,963
Mineral oils.....	11,817		
Wheat.....	39,415		8,797
All other and unclassified.....	26,457	31,655	62,998
Total.....	157,370	115,831	117,803
West coast Canada to east coast United States:			
Lumber.....	527,766	597,162	150,278
All other and unclassified.....	19,513	2,023	21,602
Total.....	547,279	599,185	171,880
West coast Canada to east coast Canada:			
Lumber.....	15,183	11,948	
All other and unclassified.....	776	831	
Total.....	15,959	12,779	
West coast Canada to east coast South America:			
Wheat.....	24,950	12,310	277
All other and unclassified.....	23,382	5,497	13,164
Total.....	48,332	17,807	13,441
West coast Canada to West Indies:			
Flour.....	10,231	4,894	
Lumber.....	8,726	18,695	6,946
All other and unclassified.....	3,522	4,817	4,272
Total.....	22,479	28,406	11,218
West coast Canada to Europe:			
Ammonium compounds.....			23,406
Barley.....	41,902	9,496	1,900
Canned food products.....	16,547	19,041	5,404
Flour.....	54,573	5,657	39,743
Fruit, fresh.....	28,449	33,659	
Grains, unclassified.....	28,268	28,658	12,500
Lumber.....	909,408	348,880	626,059
Metals:			
Lead.....	13,490	16,337	4,349
Zinc.....	30,038	25,923	9,256
Oats.....	7,101	9,622	1,000
Ores, various.....	17,825	6,450	295
Wheat.....	680,265	1,035,370	975,119
Wood pulp.....	36,265	22,299	49,355
All other and unclassified.....	18,685	25,130	39,260
Total.....	1,882,726	1,586,522	1,787,646

TABLE NO. 42.—*Important commodity shipments over principal trade route—Con.*

PACIFIC TO ATLANTIC—Continued

[Tons of 2,240 pounds]

	Fiscal year		
	1951	1950	1949
West coast Canada to Asia:			
Lumber.....	20,647	7,464	1,905
Wheat.....		109,043	11,026
All other and unclassified.....	1,984	11,922	116
Total.....	22,631	128,429	13,047
West coast Canada to Africa:			
Ammonium compounds.....			10,064
Lumber.....	156,013	108,784	181,823
Wheat.....	209,010	212,292	66,080
All other and unclassified.....	5,153	2,771	33,592
Total.....	370,176	323,847	291,559
West coast Central America/Mexico to east coast United States:			
Bananas.....	314,774	337,042	350,466
Ore, manganese.....	16,749	35,610	32,939
All other and unclassified.....	8,670	21,154	5,610
Total.....	340,184	393,806	389,015
West coast Central America/Mexico to Cristobal, C. Z.:			
Coffee.....	51,073	47,677	45,710
Lumber.....	5,501	4,589	5,028
All other and unclassified.....	17,022	8,904	8,383
Total.....	73,596	61,170	59,121
West coast Central America/Mexico to Europe:			
Bananas.....		18,243	27,383
Meats.....	9,526		1,575
Oil seeds.....	12,980	42,348	9,456
Rice.....	9,181	5,776	
All other and unclassified.....	7,128	7,282	12,885
Total.....	38,815	73,649	51,299
West coast Central America/Mexico to West Indies:			
Peas, dry.....	7,013	4,201	
All other and unclassified.....	2,011	6,597	9,042
Total.....	9,024	10,798	9,042
West coast South America to east coast United States:			
Bananas.....	164,586	133,279	98,025
Canned food products.....	9,923	5,574	6,134
Cocoa.....	19,850	12,523	13,366
Coffee.....	141,097	161,810	192,013
Fruit, fresh.....	5,188	6,203	5,122
Metals:			
Copper.....	260,272	214,575	296,274
Iron.....	25,113	50	
Lead.....	26,766	25,190	28,515
Tin.....	8,337	7,341	6,650
Zinc.....	7,359	3,519	1,097
Other and unclassified.....	2,484	6,212	2,164
Molasses.....	7,366		9,097
Nitrate of soda.....	618,611	579,663	572,904
Ores:			
Copper.....	29,210	33,007	35,218
Iron.....	2,750,625	2,501,727	2,932,376
Manganese.....	15,411	11,866	10,476
Tin.....	50,653	37,450	50,834
Zinc.....	29,935	15,980	34,293
Other and unclassified.....	12,420	3,582	8,088
Sugar.....	10,123	23,575	32,481
Wool.....	8,761	3,602	1,908
All other and unclassified.....	68,895	54,418	49,782
Total.....	4,272,994	3,841,146	4,387,317

TABLE NO. 42.—*Important commodity shipments over principal trade routes—Con.*

PACIFIC TO ATLANTIC—Continued

[Tons of 2,240 pounds]

	Fiscal year		
	1951	1950	1949
West coast South America to east coast South America:			
Rice.....	6,092	15,496	7,371
Sugar.....	33,248	36,051	31,421
All other and unclassified.....	13,626	6,730	11,626
Total.....	52,966	58,277	50,421
West coast South America to Cristobal, C. Z.:			
Bananas.....	9,717		
Coffee.....	8,130	3,293	10,811
All other and unclassified.....	14,258	11,910	15,915
Total.....	32,105	15,203	26,726
West coast South America to West Indies:			
Nitrate of soda.....	20,579	19,752	28,988
All other and unclassified.....	15,354	17,178	22,129
Total.....	35,933	36,930	51,117
West coast South America to Europe:			
Barley.....	7,636	28,982	45,298
Beans, edible, dry.....	23,840	19,497	30,503
Coffee.....	9,054	5,497	4,742
Cotton, raw.....	57,924	37,252	36,597
Lumber.....	26,221	21,025	13,279
Metals:			
Copper.....	61,389	78,550	97,336
Zinc.....	19,086	13,579	12,149
Other and unclassified.....	16,540	7,279	9,678
Mineral oils.....	149,113	155,805	142,748
Nitrate of soda.....	428,600	586,842	435,878
Oats.....	11,382	12,788	12,867
Oilseeds.....	19,185	16,621	4,934
Oil, whale.....	14,556		
Ores:			
Antimony.....	8,512	3,246	6,924
Copper.....	21,558	17,000	5,148
Manganese.....	9,356	8,374	6,913
Tin.....	34,182	28,727	27,493
Zinc.....	110,210	83,954	62,534
Other and unclassified.....	12,727	3,564	4,120
Rice.....	12,533	14,447	3,993
Sugar.....	36,063	35,898	69,271
All other and unclassified.....	63,656	67,960	97,789
Total.....	1,153,323	1,246,887	1,130,194
West coast South America to Africa:			
Nitrate of soda.....	282,631	286,004	361,931
All other and unclassified.....	3,076	152	5,973
Total.....	285,707	286,156	367,904
West coast South America to Asia:			
Nitrate of soda.....	13,000	10,013	
Sugar.....	9,758		
All other and unclassified.....		3,007	
Total.....	22,758	13,020	
Hawaiian Islands to east coast United States:			
Canned fruit.....	284,312	284,906	199,550
Molasses.....			19,831
Scrap metal.....	4,654	2,233	58,670
Sugar.....	194,145	388,676	77,706
All other and unclassified.....	25,847	15,524	37,724
Total.....	508,958	691,339	393,481

TABLE NO. 42.—*Important commodity shipments over principal trade routes—Con.*

PACIFIC TO ATLANTIC—Continued

[Tons of 2,240 pounds]

	Fiscal year		
	1951	1950	1949
Australasia to east coast United States:			
Metals:			
Iron.....	12,300	8,000	28,492
Lead.....			33,855
Ores:			
Chrome.....	45,860	56,500	57,005
Manganese.....	6,984		
Sand.....	21,337	6,569	14,947
Scrap metal.....	6,823	23,328	32,468
Skins and hides.....	17,261	27,442	14,153
Wool.....	88,242	57,812	35,376
All other and unclassified.....	31,432	22,905	39,606
Total.....	230,239	202,556	255,902
Australasia to east coast Canada:			
Dairy products, refrigerated.....	7,458	174	130
Fruit, dried.....	14,948	13,254	14,001
Sugar.....	68,736	40,784	37,056
Wool.....	11,933	15,552	16,131
All other and unclassified.....	13,039	17,851	22,240
Total.....	116,114	87,615	89,558
Australasia to West Indies:			
Canned food products.....	9,908	14,539	8,152
Dairy products, refrigerated.....	8,720	12,229	7,533
All other and unclassified.....	8,775	6,135	3,625
Total.....	27,403	32,903	19,310
Australasia to Europe:			
Canned food products.....	34,512	39,245	48,944
Copra.....	88,887	83,039	97,212
Dairy products, refrigerated.....	200,508	222,903	232,661
Fruit, fresh.....	12,150	17,306	12,282
Meat, refrigerated.....	228,854	319,942	340,379
Metals:			
Lead.....	14,069	18,701	24,565
Zinc.....	11,365	6,519	10,050
Other and unclassified.....	5,634	54	1,260
Ores:			
Chrome.....	7,336	5,335	5,400
Zinc.....	6,554	11,583	22,086
Pears, dried.....	4,242	7,942	7,002
Skins and hides.....	10,452	12,819	17,908
Sugar.....	23,004	2,000	46,654
Tallow.....	17,095	28,699	26,157
Whale oil.....	19,146		
Wheat.....	17,899	9,427	46,130
Wool.....	81,688	148,516	161,646
All other and unclassified.....	62,732	62,176	98,596
Total.....	846,127	996,236	1,198,932
Asia to east coast United States:			
Canned food products.....	82,264	62,591	25,355
Coconuts.....	38,584	30,419	65
Copra.....	119,783	97,818	104,351
Hemp, unmanufactured.....	30,691	19,802	17,272
Iron and steel manufactures.....	51,601	2,410	5,508
Lumber.....	52,657	10,592	11,001
Metals:			
Copper.....	10,731	29,127	952
Iron.....	16,587	401	9,539
Lead.....	4,385	14,900	1,541
Other and unclassified.....	32,921	21,481	10,292
Ores:			
Bauxite.....	286,763	417,074	421,610
Chrome.....	192,903	116,971	165,645
Manganese.....	13,441	16,319	26,698
Other and unclassified.....	10,338	15,588	41,247

TABLE NO. 42.—*Important commodity shipments over principal trade routes—Con.*

PACIFIC TO ATLANTIC—Continued

[Tons of 2,240 pounds]

	Fiscal year		
	1951	1950	1949
Asia to east coast United States—Continued			
Porcelainware.....	25,562	18,539	13,480
Rubber, crude.....	73,815	48,962	69,712
Scrap metal.....	81,406	88,516	195,220
Sugar.....	562,875	397,672	367,915
Vegetable oils:			
Coconut.....	52,532	36,908	29,969
Wood.....	9,496	8,563	31,906
Other and unclassified.....	12,420	5,141	3,939
All other and unclassified.....	203,676	121,404	135,437
Total.....	1,964,831	1,491,201	1,688,654
Asia to east coast Canada:			
Scrap metal.....		4,504	29,020
All other and unclassified.....		6,016	
Total.....		10,520	29,020
Asia to east coast South America:			
Copra.....	45,665	11,820	10,830
All other and unclassified.....	100	430	
Total.....	45,765	12,250	10,830
Asia to West Indies:			
Mineral oils.....	16,106		
All other and unclassified.....	3,353	109	29
Total.....	19,459	109	29

TABLE NO. 43.—*Vessels transiting Canal free of tolls*

	Fiscal year 1951			Total, fiscal year—	
	Atlantic to Pacific	Pacific to Atlantic	Total	1950	1949
UNITED STATES GOVERNMENT VESSELS					
Number of transits:					
On net tonnage basis:					
Chartered.....	234	97	331	103	305
Owned.....	243	296	539	815	712
On displacement basis (owned).....	73	65	138	102	248
Total transits.....	550	458	1,008	1,020	1,265
Tonnage:					
Panama Canal net:					
Chartered.....	1,300,234	543,115	1,843,349	562,373	1,632,743
Owned.....	585,484	663,447	1,248,931	1,646,415	825,305
Total Panama Canal net tonnage.....	1,885,718	1,206,562	3,092,280	2,208,788	2,458,048
Displacement tonnage (owned).....	330,692	303,507	634,199	283,840	710,457
Approximate value of tolls:					
Chartered.....	\$1,029,629	\$423,901	\$1,453,530	\$490,143	\$1,381,930
Owned (including displacement).....	671,065	669,216	1,340,281	1,536,307	1,079,687
Total value of tolls.....	1,700,694	1,093,117	2,793,811	2,026,450	2,461,617

TABLE NO. 43.—*Vessels transiting Canal free of tolls*—Continued

	Fiscal year 1951			Total, fiscal year—	
	Atlantic to Pacific	Pacific to Atlantic	Total	1950	1949
UNITED STATES GOVERNMENT VESSELS—Continued					
Cargo (long tons):					
Chartered.....	599,155	75,763	674,918	596,148	1,881,947
Owned.....	457,467	33,875	491,342	834,140	335,714
Total cargo.....	1,056,622	109,638	1,166,260	1,430,288	2,217,661
COLOMBIAN NAVAL VESSELS					
Number of transits:					
On net tonnage basis.....	11	10	21	26	11
On displacement tonnage basis.....	1	—	1	8	10
Total transits.....	12	10	22	34	21
Tonnage:					
Panama Canal net.....	8,516	7,267	15,783	27,544	9,820
Displacement.....	1,200	—	1,200	11,735	14,861
Approximate value of tolls.....	\$8,263	\$5,232	\$13,495	\$28,306	\$15,444
Cargo (long tons).....	17,177	—	17,177	28,412	10,080
PANAMANIAN GOVERNMENT VESSELS					
Number of transits:					
On net tonnage basis.....	3	1	4	3	3
On displacement basis.....	—	—	—	—	—
Total transits.....	3	1	4	3	3
Tonnage:					
Panama Canal net.....	30	10	40	30	30
Displacement.....	—	—	—	—	—
Approximate value of tolls.....	\$22	\$7	\$29	\$21	\$21
Cargo (long tons).....	—	—	—	—	—
VESSELS TRANSITING SOLELY FOR REPAIRS					
Number of transits:					
On net tonnage basis.....	3	6	9	4	—
On displacement tonnage basis.....	1	1	2	—	—
Total transits.....	4	7	11	4	4
Tonnage:					
Panama Canal net.....	418	1,082	1,500	12,224	12,004
Displacement.....	2,277	2,277	4,554	—	—
Approximate value of tolls.....	\$1,439	\$1,917	\$3,356	\$8,802	\$10,710
Cargo (long tons).....	—	—	—	—	17,714
GRAND TOTAL OF VESSELS TRANSITING FREE					
Number of transits:					
On net tonnage basis.....	494	410	904	951	1,035
On displacement tonnage basis.....	75	66	141	110	258
Total transits.....	569	476	1,045	1,061	1,293
Tonnage:					
Panama Canal net.....	1,894,682	1,214,921	3,109,603	2,248,586	2,479,902
Displacement.....	334,169	305,784	639,953	295,575	725,318
Approximate value of tolls.....	\$1,710,418	\$1,100,273	\$2,810,691	\$2,063,579	\$2,487,792
Cargo (long tons).....	1,073,799	109,638	1,183,437	1,458,700	2,245,455

NOTE.—For further information on tolls-free traffic see p. 17.

TABLE No. 44.—*Water supply and expenditures*

	Million cubic feet year ended June 30—		Percent of available water supply, year ended June 30—	
	1951	1950	1951	1950
MADDEN AND GATUN LAKE WATER SUPPLY				
Direct inflow into Madden Lake.....	108,621	97,652		
Evaporation from Madden Lake.....	2,354	2,436		
Available for Madden Lake uses.....	106,267	95,216		
Direct inflow into Gatun Lake.....	151,681	142,319		
Subtotal.....	257,948	237,535		
Evaporation from Gatun Lake.....	17,811	19,623		
Available for Gatun Lake uses.....	240,137	217,912		
MADDEN LAKE WATER EXPENDITURES				
Madden hydroelectric power.....	51,059	56,114	47.7	62.0
Madden spillway discharge.....	55,926	34,332	52.3	38.0
Total Madden Lake expenditures.....	106,985	90,446	100.0	100.0
Net storage gain or loss, Madden Lake.....	-718	+4,770		
GATUN LAKE WATER EXPENDITURES				
Gatun hydroelectric power.....	75,660	78,130	31.4	37.7
Gatun and Pedro Miguel lockages.....	48,834	44,642	20.2	21.5
Municipal and other uses.....	2,363	2,492	1.0	1.2
Subtotal Gatun Lake uses.....	126,857	125,264	52.6	60.4
Gatun spillway discharge.....	114,227	81,985	47.4	39.6
Total Gatun Lake expenditures.....	241,084	207,249	100.0	100.0
Net annual run-off available, Gatun Lake.....	240,137	217,912		
Net storage gain or loss, Madden and Gatun Lakes.....	-947	+10,663		

TABLE No. 45.—*Dredging operations*

[Cubic yards]

	Earth	Rock	Total
Canal prism dredging:			
Atlantic entrance maintenance.....	1,203,500	251,500	1,455,000
Atlantic entrance, project No. 8 approach to Gatun Locks.....	68,000	11,500	79,500
Gatun Lake maintenance.....	2,900	1,100	4,000
Gaillard Cut maintenance, including slides.....	409,200	194,900	604,100
Gaillard Cut, project No. 13.....	78,300	277,700	356,000
Total, Canal prism.....	1,761,900	736,700	2,498,600
Auxiliary dredging:			
Cristobal inner harbor, maintenance.....	1,024,100	159,500	1,183,600
Cristobal approach channel.....	1,363,800	71,000	1,434,800
West anchorage, Limon Bay.....	2,363,000	32,000	2,395,000
Cristobal Harbor, Marine Railway No. 2.....	2,500		2,500
Total, auxiliary.....	4,753,400	262,500	5,015,900
Grand total:			
Fiscal year 1951.....	6,615,300	999,200	¹ 7,614,500
Fiscal year 1950.....	7,881,300	1,008,700	8,890,000

¹ Does not include 15,770 cubic yards of chain sand.

Dredging operations are carried on in three major districts, the Atlantic district extending from contour 42 feet below mean sea level in the Atlantic Ocean to Gatun locks; the Central district, extending from Gatun locks to Pedro Miguel locks; and the Pacific district, extending from Pedro Miguel locks to contour 50 feet below mean sea level in the Pacific Ocean. The total excavation in these three areas is summarized as follows:

[Cubic yards]

	District			Total
	Atlantic	Central	Pacific ¹	
Canal prism:				
Earth.....	1, 271, 500	490, 400	-----	1, 761, 900
Rock.....	263, 000	473, 700	-----	736, 700
Total.....	1, 534, 500	964, 100	-----	2, 498, 600
Auxiliary:				
Earth.....	4, 753, 400	-----	-----	4, 753, 400
Rock.....	262, 500	-----	-----	262, 500
Total.....	5, 015, 900	-----	-----	5, 015, 900
Total:				
Earth.....	6, 024, 900	490, 400	-----	6, 515, 300
Rock.....	525, 500	473, 700	-----	999, 200
Grand total:				
Fiscal year 1951.....	6, 550, 400	964, 100	-----	² 7, 514, 500
Fiscal year 1950.....	1, 224, 000	2, 863, 500	4, 802, 500	8, 890, 000

¹ No dredging in Pacific district during the year.² Does not include 15,770 cubic yards of chame sand.

TABLE NO. 46.—Principal equipment operated by dredging division

Unit and name	Type	In service	Out of service	
			Repairs	Reserve or standby
		<i>Months</i>	<i>Months</i>	<i>Months</i>
Dredges:				
<i>Cascades</i>	15-yard dipper.....	7.8	4.2	-----
<i>Gambou</i>	do.....	-----	-----	12.0
<i>Paraiso</i>	do.....	4.2	.8	7.0
<i>Las Cruces</i>	24-inch suction.....	-----	3.0	9.0
<i>Mindi</i>	28-inch suction.....	11.8	.2	-----
Craneboat: <i>Atlas</i>	75-ton.....	6.7	1.4	3.9
Derrick barge: No. 157.....	40-ton.....	.8	.1	11.1
Grader barge: No. 4.....	14-inch pumps.....	10.5	1.3	.2
Relay barge: No. 24.....	24-inch pumps.....	-----	-----	12.0
Drillboats:				
<i>Vulcan</i>	-----	-----	-----	12.0
<i>Thor</i>	-----	-----	2.0	10.0
Air compressor: No. 29.....	2,500 cubic feet per minute.....	-----	-----	12.0
Floating cranes:				
<i>Hercules</i>	250-ton.....	6.7	-----	5.3
<i>Ajax</i>	do.....	5.3	-----	6.7
Ferry boats:				
<i>Presidente Amador</i>	-----	10.7	-----	1.3
<i>Presidente Roosevelt</i>	-----	8.6	1.3	2.1
<i>Presidente Porras</i>	-----	5.2	1.9	4.9

In addition to the above, large and small tugs and an attendant fleet of dump scows, sand barges, and service lighters, launches, quarter boats, and related drilling and excavating equipment were also operated as part of the dredging plant.

TABLE NO. 47.—Activities of terminal tank farms

	Fiscal year		
	1951	1950	1949
Fuel and Diesel oil:	<i>Barrels</i>	<i>Barrels</i>	<i>Barrels</i>
Received by the Panama Canal.....	156,635	73,497	404,250
Used by the Panama Canal.....	104,097	121,515	195,892
Sold by the Panama Canal.....	49,988	31,134	139,615
Miscellaneous transfers on tank farms.....	22,258	8,548	11,320
Pumped for outside interests.....	11,071,864	9,557,829	10,389,753
Total barrels handled.....	11,404,842	9,792,523	11,140,830
Handled at Mount Hope (Atlantic side).....	9,960,996	8,379,014	8,420,750
Handled at Balboa and Gamboa (Pacific side).....	1,434,846	1,413,509	2,720,080
Number of ships discharging or receiving fuel and Diesel oil:			
Panama Canal craft.....	96	97	154
All others.....	2,509	2,475	2,328
Total.....	2,605	2,572	2,482
Gasoline and kerosene received:			
By the Panama Canal:	<i>Gallons</i>	<i>Gallons</i>	<i>Gallons</i>
Bulk gasoline.....	19,447,267	10,693,194	14,822,217
Bulk kerosene.....	2,209,724	1,298,912	9,993,956
By outsiders:			
Bulk gasoline.....	30,459,907	25,509,237	19,471,182
Bulk kerosene.....	5,678,843	3,914,425	4,637,521
Financial results of operations:			
Total revenues.....	\$2,142,306	\$2,558,046	\$3,159,751
Total expenditures (including cost of sales).....	2,111,302	2,485,535	3,025,476
Net revenues.....	31,004	72,511	134,275

TABLE NO. 48.—Number of employees paid at U. S. rates

	As of—		Increase	Decrease
	June 30, 1951	July 1, 1950 ¹		
THE PANAMA CANAL—TRANSIT UNITS				
<i>Management and executive direction</i>				
Governor's office and staff units (exclusive of civil intelligence).....	29	28	1	-----
<i>Canal operation</i>				
Navigation.....	249	246	3	-----
Dredging division.....	148	152	-----	4
Locks division.....	345	383	-----	38
<i>Administrative and general services</i>				
Administrative branch.....	52	41	11	-----
Finance director.....	6	5	1	-----
Accounting division.....	270	296	-----	26
Audit division.....				
Fiscal division.....				
Payroll division.....				
Personnel bureau.....	76	70	6	-----
Engineering and construction director.....	5	5	-----	-----
Engineering division.....	103	89	14	-----
Meteorology and hydrography branch.....	15	15	-----	-----
Community services director:				
Grounds maintenance.....	68	59	9	-----
Housing division—all other than living quarters.....				
Thatcher ferry.....	29	26	3	-----

¹ Panama Canal Press and oil-handling plants transferred to Panama Railroad Company effective July 1, 1950, under Executive Order No. 10101.

TABLE NO. 48.—Number of employees paid at U. S. rates—Continued

	As of—		Increase	Decrease
	June 30, 1951	July 1, 1950 ¹		
<i>Civil government</i>				
Customs and immigration division.....	65	65	-----	-----
Magistrates courts.....	6	6	-----	-----
Police (including civil intelligence).....	240	212	28	-----
Fire.....	77	80	-----	3
Schools.....	193	220	-----	27
Physical education and recreation.....	25	24	1	-----
Licenses.....	7	9	-----	2
Libraries.....	9	6	3	-----
<i>Health bureau</i>				
Administration and preventive medicine.....	467	494	-----	27
City health offices.....				
Hospitals.....				
Medical and dental clinics.....				
Sanitation and quarantine.....				
Subtotal—transit units.....	2,484	2,531	80	127
Net decrease.....	-----	-----	-----	47
THE PANAMA CANAL—BUSINESS OPERATIONS, POSTS, AND CLUBHOUSES				
Water system.....	53	48	5	-----
Power system.....	62	57	5	-----
Municipal work.....	125	138	-----	13
Electrical work.....	149	156	-----	7
Building division.....	133	150	-----	17
Purchase and supply.....	80	67	13	-----
Motor transportation.....	135	149	-----	14
Industrial bureau.....	268	276	-----	8
Housing division—living quarters.....	0	0	-----	-----
Canal Zone posts.....	103	108	-----	5
Clubhouse division.....	45	66	-----	21
Subtotal—business operations, Canal Zone posts, and clubhouses.....	1,153	1,215	23	85
Net decrease.....	-----	-----	-----	62
Total, the Panama Canal.....	3,637	3,746	103	212
Net decrease.....	-----	-----	-----	109
PANAMA RAILROAD COMPANY				
Telephone system.....	37	37	-----	-----
Commissary division.....	263	252	11	-----
Hotels.....	9	20	-----	11
Panama Railroad Press.....	18	23	-----	5
Railroad and terminals:	113	115	-----	2
Director.....				
Transportation.....				
Maintenance.....				
Terminals (docks).....	97	84	13	-----
Marine bunkering.....	42	45	-----	3
Total, Panama Railroad Company.....	579	576	24	21
Net increase.....	-----	-----	3	-----
Total force.....	24,216	24,322	127	233
Net decrease, total force.....	-----	-----	-----	106

¹ Panama Canal Press and oil-handling plants transferred to Panama Railroad Company effective July 1, 1950, under Executive Order No. 10101.

² Excludes 208 part-time and WAE and 6 employees paid by petty cash voucher.

³ Excludes 189 part-time and WAE and 44 employees paid by petty cash vouchers.

TABLE NO. 49.—Number of employees paid at local rates

	As of—		Increase	Decrease
	June 30, 1951	July 1, 1950 ¹		
THE PANAMA CANAL—TRANSIT UNITS				
<i>Management and executive direction</i>				
Governor's office and staff units (exclusive of civil intelligence).....	0	0	-----	-----
<i>Canal operations</i>				
Navigation.....	969	961	8	-----
Dredging division.....	803	833	-----	30
Locks division.....	896	908	-----	12
<i>Administrative and general services</i>				
Administrative branch.....	37	36	1	-----
Finance director.....	0	0	-----	-----
Accounting division.....	27	25	2	-----
Audit division.....				
Fiscal division.....				
Payroll division.....				
Personnel bureau.....	34	32	2	-----
Engineering and construction director.....	0	0	-----	-----
Engineering division.....	156	39	117	-----
Meteorology and hydrography branch.....	32	32	-----	-----
Community services director.....	0	0	-----	-----
Grounds maintenance.....	448	456	-----	8
Housing division—all other than living quarters.....	132	141	-----	9
Thatcher ferry.....	61	57	4	-----
<i>Civil government</i>				
Customs and immigration division.....	15	3	12	-----
Magistrates courts.....	2	2	-----	-----
Police (including civil intelligence).....	43	43	-----	-----
Fire.....	0	0	-----	-----
Schools.....	239	230	9	-----
Physical education and recreation.....	37	35	2	-----
Licenses.....	1	1	-----	-----
Libraries.....	4	3	1	-----
<i>Health bureau</i>				
Administration and preventive medicine.....	1, 142	1, 174	-----	32
City health offices.....				
Hospitals.....				
Medical and dental clinics.....				
Sanitation and quarantine.....	5, 078	5, 011	158	91
Subtotal—transit units.....				
Net increase.....	-----	-----	67	-----
THE PANAMA CANAL—BUSINESS OPERATIONS, POSTS, AND CLUBHOUSES				
Water system.....	105	90	15	-----
Power system.....	100	100	-----	-----
Municipal work.....	796	909	-----	113
Electrical work.....	253	254	-----	1
Building division.....	1, 013	1, 164	-----	151
Purchase and supply.....	389	331	58	-----
Motor transportation.....	405	417	-----	12
Industrial bureau.....	430	352	78	-----
Housing division—living quarters.....	123	139	-----	16
Canal Zone posts.....	59	59	-----	-----
Clubhouse division.....	251	451	-----	200
Subtotal—business operations, Canal Zone posts, and clubhouses.....	3, 924	4, 266	151	493
Net decrease.....	-----	-----	-----	342
Total, the Panama Canal.....	9, 002	9, 277	309	584
Net decrease.....	-----	-----	-----	275

¹ Panama Canal Press and oil-handling plants transferred to Panama Railroad Company effective July 1, 1950, under Executive Order No. 10101.

TABLE NO. 49.—*Number of employees paid at local rates*—Continued

	As of—		Increase	Decrease
	June 30, 1951	July 1, 1950 ¹		
PANAMA RAILROAD COMPANY				
Telephone system.....	21	21		
Commissary division.....	2, 124	2, 120	4	
Hotels.....	138	254		116
Panama Railroad Press.....	107	114		7
Railroad and terminals:				
Director.....	}			
Transportation.....		431	430	1
Maintenance.....				
Terminals (docks).....	2, 595	2, 151	444	
Marine bunkering.....	101	103		2
Total, Panama Railroad Company.....	5, 517	5, 193	449	125
Net increase.....			324	
Total force.....	² 14, 519	³ 14, 470	758	709
Net increase, total force.....			49	

¹ Panama Canal Press and oil-handling plants transferred to Panama Railroad Company effective July 1, 1950, under Executive Order No. 10101.

² Excludes 690 part-time and 320 employees paid by petty cash vouchers.

³ Excludes 530 part-time and 245 employees paid by petty cash vouchers.

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